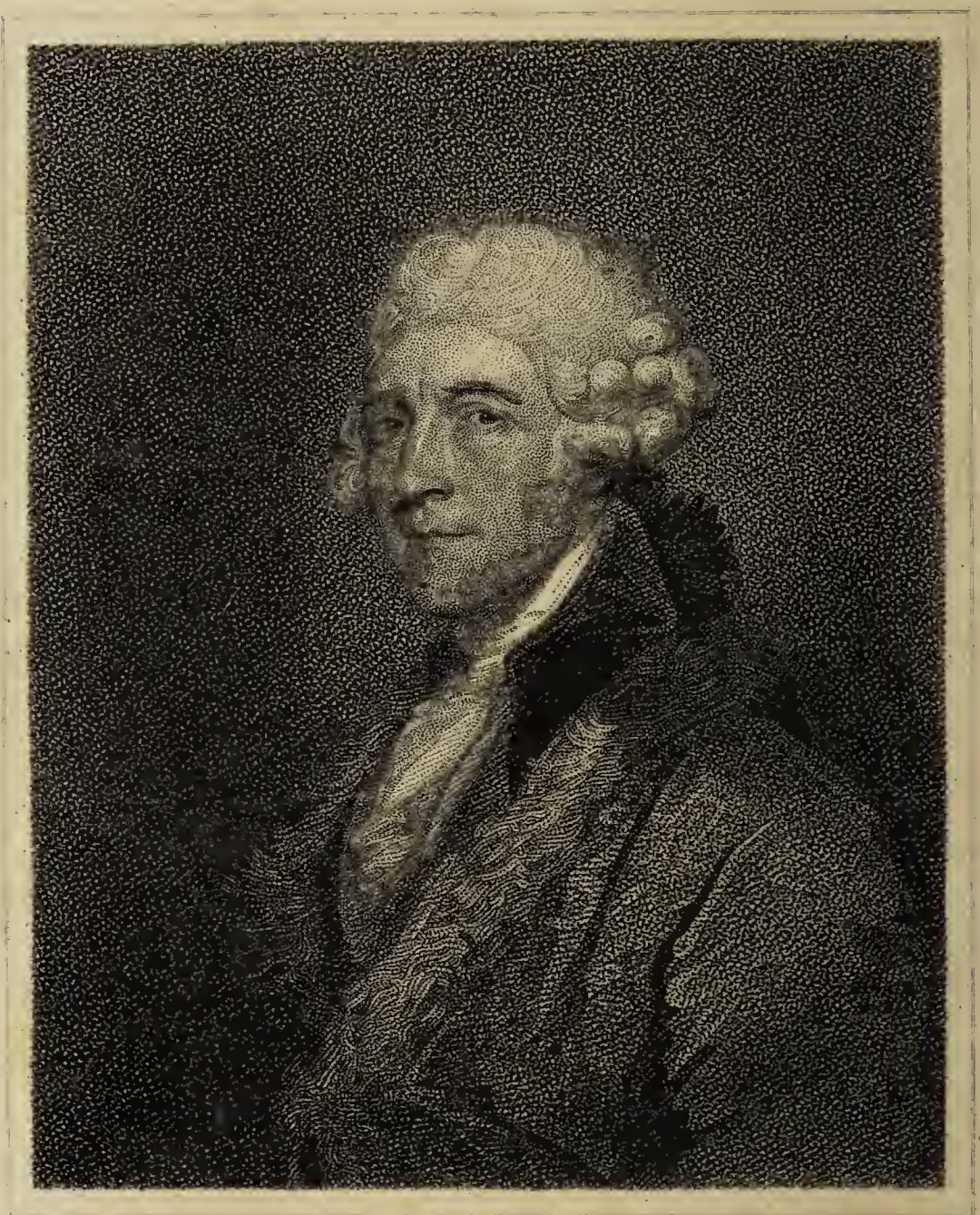
HONI SOIT QUI MAL Y PENSE



CALEB WHITEFOORD, ESQR F.R & A.S.

Late a Vice President of the Society for the Encouragement of Arts, Manufactures & Commerce.

Engraved by Wm Holl, from an original Painting by Stuart, in the Possession of Mrs Whitefoord.

16786

TRANSACTIONS

OF THE

SOCIETY

INSTITUTED AT LONDON,

FOR THE

ENCOURAGEMENT

OF

ARTS, MANUFACTURES, AND COMMERCE;

WITH THE

PREMIUMS offered in the Year 1811,

AND

THEIR RULES AND ORDERS.

VOL. XXIX.

LONDON:

PRINTED BY R. WILKS, CHANCERY-LANE.

Sold by the HOUSEKEEPER, at the SOCIETY' HOUSE, in the ADELPHI; and by Messrs. ROBSON, J. WHITE, BECKET, JOHNSON, CADELL and DAVIES, PHILLIPS, WALTER, RICHARDSON, LONGMAN and REES, TAYLOR, and WYATT

MDCCCXII.

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PREFACE.

THE PORTRAIT prefixed to the present Volume is that of CALEB WHITEFOORD, Esq. late a VICE PRESIDENT of the Society; it is beautifully engraved by Mr. Holl, from an original painting by Stuart.

Mr. WHITEFOORD was one of the oldest contributors to the Society; he was elected a Member in the year 1762, a Chairman of the POLITE ARTS in 1786, and one of their VICE PRESIDENTS in the year 1800.

The great attention which he always paid to the interests of the Society, and his active services, naturally claim a more particular account of him then is usually given in our Preface on similar occasions, and we doubt not of the following sketch being very acceptable to our readers.

CALEB WHITEFOORD, Esq. born at Edinburgh in the year 1734, was the only son of Charles Whitefoord, of Ayreshire, formerly Colonel of the Fifth Regiment of Foot. At an early age he was placed in the school of Mr. Mundell, and afterwards completed his education at the University of Edinburgh, where he made so great a proficiency in classical knowledge, that his father intended him for the Church; but finding his son had strong objections, he brought him to London, and placed him in the counting-house of his friend Archibald Stewart, Esq. M. P. an eminent wine-merchant in York-buildings, where he remained four years; he then went to France, where he continued two years, till he became of age; and returning to London, commenced business, by entering into partnership with Mr. Thomas Brown, of Craven-street, in the Strand.

Here the celebrated Doctor Benjamin Franklin, being his nearest neighbour, and Mr. WHITEFOORD being eager in the pursuit of knowledge, a friendly intercourse soon commenced, which continued throughout life.

In the year 1782, Lord Shelburne became Minister, and being determined to put an end to the American War, Mr. WHITEFOORD was selected as a proper person to be sent to meet Dr. Franklin at Paris, to negotiate the Preliminary Treaty of Peace with America. In this business he was employed during the greatest part of that year; and having succeeded

succeeded in his object, His Majesty for that service was pleased to grant him a pension.

Possessed of a considerable share of wit, humour, and learning, Mr. WHITEFOORD lived in habits of intimacy with the greatest geniuses of the age. He was a Member of the Royal Societies of London and Edinburgh; the Society of Antiquaries; the Philosophical Society of Philadelphia; and the Arcadian Society of Rome; and one of the VICE PRESIDENTS of the Society for the Encouragement of Arts, Manufactures, and Commerce, of which he had been a Member 48 years.

In his younger years Mr. WHITEFOORD wrote many essays, poems, and epigrams, most of which he sent to the Printer of the Public Advertiser, Mr. H. S. Woodfall, for whom he had a great esteem. He much improved, if he was not the original inventor, of Cross-readings—Ship News Extraordinary—Errors of the Press—Female Administration, &c. &c. under the signature of *Papyrius Cursor*;—several of which pieces are collected in Debrett's Foundling Hospital for Wit.

His political bias never interfered with his literary friendships, and it was truly observed by Dr. Adam Smith, that although the Junto of Wits and Authors hated one another heartily, they had all a sincere regard for Mr. WHITE-

FOORD, who by his conciliatory manners and happy adaptation of circumstances, kept his circle together in amity and good humour.

Mr. WHITEFOORD died, after a short illness, in February, 1810, in the 77th year of his age.

This hasty sketch cannot be better closed, than by the characteristic Epitaph, designed for him in the supplementary lines to the fourth and subsequent editions of Dr. Goldsmith's poem, called Retaliation.

Here WHITEFOORD reclines, and deny it who can,
Tho' he merrily lived, he is now a *grave* man!
Rare compound of oddity, frolic and fun,
Who relish'd a joke, and rejoic'd in a pun;
Whose temper was gen'rous, open, sincere,
A stranger to flattery, a stranger to fear;
Who scatter'd around wit and humour at will,
Whose daily *bons mots* half a column might fill.
A Scotchman from pride and from prejudice free,
A Scholar, yet surely no pedant was he.
What pity, alas! that so lib'ral a mind
Should so long be to Newspaper Essays confined;
Who perhaps to the summit of science might soar,
Yet content if the table he set on a roar;
Whose talents to fill any station were fit,
Yet happy if Woodfall confess'd him a Wit.

Ye

Ye Newspaper witlings, ye pert scribb'ling folks,
Who copied his squibs, and re-echoed his jokes.
Ye tame imitators, ye servile herd, come,
Still follow your Master and visit his tomb;
To deck it bring with you festoons of the vine,
And copious libations bestow on his shrine;
Then strew all around it (you can do no less)
Cross readings, Ship News, and Mistakes of the Press.
Merry WHITEFOORD farewell, for thy sake I admit
That a Scot may have humour, I'd almost said wit;
This debt to thy memory I cannot refuse,
Thou best humour'd man, with the worst humour'd muse.

WE shall now proceed to notice, in our usual manner, the contents of the present Volume, commencing with that very important class, Agriculture, which has ever occupied the first place in the annals of the Society.

The great exertions made by Dr. A. Bain, in forming Plantations at Heffleton, in Dorsetshire, cannot fail to afford very great satisfaction to every observer of them; the plantations for which he was rewarded a few years ago by the Society, are in a most flourishing state. The beauty and luxuriance of his Pinasters, appear to bid defiance to the stormy winds to which his estate is exposed from the sea; and shew the propriety of planting this valuable timber tree,

not only on account of its own merit, but also as a barrier and protection to other timber-trees, which flourish behind its cover.

Few plantations in the kingdom exhibit so much taste and judgement in their formation, and it is perhaps impossible that land of so poor a quality could be more usefully and advantageously employed. His late plantations, rewarded the present year, we believe include the whole of the waste land in his possession on that estate. It would be of great service to the Public, if the comparative growths of trees were more generally stated to the Society, in the manner noted in Dr. Bain's communication.

The late H. Andrews, Esq. of Wakefield, being very anxious to obtain one of the Society's honorary Rewards, the Gold Medal was adjudged to him for his plantations of Oaks, which he had judiciously introduced amongst his extensive plantations. Death snatched the honour from him at the moment it was within his grasp, but the Society liberally directed their Gold Medal to be presented to his daughters.

The great value of Larch Trees as timber, is too well known to require any illustration, and we have the satisfaction to state, that since January 1808, 684,560 Larches have been planted by William Congreve, Esq. for which he

has

has received the Gold Medal, being the second Reward for Plantations conferred upon him by the Society.

Though fortune has not enabled Mr. Henry Cowlishaw to form plantations to an equal extent with men of greater opulence, his plantation of 75,000 Larches affords an example of exertion and industry too great to be overlooked by the Society.

The draining of wet land, the conveyance of water under ground, the improvement of durability in buildings, and preventing the waste of bricks, have engaged the attention of John Stephens, Esq. of Reading, who by a very cheap plan, hath contributed much to the purposes above-mentioned.

In our variable climate, great mischief frequently arises from bad and rainy weather at the time of harvest, and the Society have taken considerable pains to produce to the public, some mode by which such losses could be obviated. A very simple and ingenious contrivance, invented by William Jones, Esq. secures the sheaves of corn from injury when obliged to be cut in wet weather, and prevented considerable injury which he must otherwise have inevitably sustained, both in his corn and other crops.

To

To Mr. Charles Waistell the Public are much indebted for many valuable papers in the Transactions of the Society, on the growth of timber, its value at different distant periods, &c.; the ingenious instrument he has now produced for the purpose of dibbling acorns, is well calculated for that useful purpose.

The culture and preparation of Hemp in England has been hitherto confined within so very narrow a compass, that it became desirable that the process should be more generally known. The communication of H. B. Way, Esq. of Bridport Harbour, will doubtless contribute to this effect, and to render us more independent of foreign powers for an article so essentially necessary for our Navy. The remarks which this gentleman has also furnished on the culture of Sea-cale, will prove that this excellent vegetable, which has only been considered frequently as an article of luxury, does not require the expence hitherto laid out on its culture, but may be advantageously cultivated on land applicable to few other purposes, and is even spontaneously produced on the sea cliffs.

In the class of Chemistry, H. B. Way, Esq. has shewn the advantages arising from attention and experiment, in opposition to vulgar prejudice; it had been supposed that sea sand was in no place applicable to any advantageous mixture with lime for plaster, but the exposure of a Stucco of this

nature

nature for nearly seven years, close to the sea at Bridport Harbour, in a situation open in the greatest degree to sea winds and storms, is a fact which must satisfactorily prove to any observer, that a plaster composed of these materials is capable of being safely applied on the exterior of buildings, and to shew no signs of damp on the papers or walls within.

An extensive list of the Rewards bestowed by the Society with a view to the Encouragement of the Polite Arts, is shewn at page 23 of the present volume, describing the names and addresses of the claimants, and the particular subjects for which the Premiums and Bounties have been given this Session.

Under the Class of Manufactures, Mr. Edward Smith, of Brentwood, will be found to have extended his unremitting endeavours for the service of the Poor, and for rendering useful a vegetable hitherto looked upon as a noxious weed. The fibres which he has sent as specimens produced from the nettle, are not inferior in quality, in any respect, to those of the best hemp and flax.

The Tartan or Plaid Hose, which are in high estimation in North Britain, have hitherto been tedious and expensive to weave; Mr. J. Robertson has contrived an apparatus, by which not only this business can be better effected, but improvements

provements will arise from it in the manufacture of other articles.

Inventions and improvements in the various branches of Mechanics, have ever been particularly considered by the Society, and their endeavours have generally been, annually, attended with great advantages to the Public.

The loss of the great and gallant Lord Nelson, and of other naval officers, who have fallen sacrifices to the marksmen stationed in the tops of the enemy's ships, suggested to Captain Bagnold, R. M. the necessity of preventing such mischief; to obviate which, he has invented a gun and carriage, which admits of a proper elevation, and accurate aim, to be taken at the object, and by a discharge of 144 musket balls at every fire, to clear away the men in the enemy's rigging in close action.

The ingenious pump invented by Mr. William Brunton, will much facilitate the sinking of mines, and prevent many of the accidents to which the pumps heretofore employed for such purpose are liable.

The great advantages of taking accurate observations at sea, have been well considered by Mr. J. Allan, who was honored the former Session with a Gold Medal for his

improvements

improvements in a Mathematical Dividing Engine. During the last session he has produced an Improved Reflecting Circle for nautical purposes, by which observations can be taken at sea with more facility and accuracy than heretofore, with an instrument not more expensive than the one in common use.

Mr. John Hodgson has invented a very simple mode of ascertaining the Variations in the Mariner's Compass, without having recourse to the minute and tedious calculations formerly necessary, and which instrument is also particularly useful in land surveying.

Henry Earle, Esq. has taken considerable pains in the construction of a bed, by the use of which, persons whose limbs have been dangerously fractured, or whose particular diseases will not allow them to be moved, without great danger of their lives, may enjoy the advantages of frequent changes of linen, and other comforts, which in common beds could not be obtained.

To prevent pain in the necessary operations of surgery is a very desirable object, and much of the pain experienced in the common modes of Scarification and cupping, is obviated by a Scarificator lately invented by Mr. Fuller, which executes the business with greater certainty and effect.

Improvements

Improvements in the art of clock and watch making, have been the source of great advantages to the mechanic arts. The Remontoire Escapement lately invented by Mr. George Prior, for pendulum clocks, will be much admired for the accuracy of its motion, performed with little or no friction.

The deleterious effects of mercurial vapours, when inhaled, during the operation of gilding metals, and on various other occasions, will be avoided by the use of a Mask invented by Mr. Richard Bridgen, which enables the operator to breathe fresh air without danger of the noxious fume before him. This machine is coming into very general use in the trade.

The method of pointing needles in the common way, has been represented to the Society as so dangerous, that the persons concerned in it seldom live more than eight or ten years, owing to consumptive complaints brought on by inspiring the small particles of iron and stone separated in grinding them. Mr. Thomas Wood has invented an expedient for executing this business in such a manner, as to obviate great part of this mischief, by the particles of stone and iron being caught and retained by wet cloths.

The great inconvenience arising from the Steam of Boilers

in

in wash-houses, brew-houses, and even in private families, has been very generally complained of; the contrivance of a Steam Chimney, by Mr. G. Webster, which prevents this evil, is simple, and presents several advantages.

The improvements made by Mr. John Prior, in the Striking part of a Clock evince great ingenuity, and the motions are performed with much ease and simplicity.

In the class of Colonies and Trade, it will be observed that the Society has continued its endeavours for promoting the methods of preparing British White Herrings, equal to the Dutch. Holland acquired the greatest part of her wealth from her fisheries; many hundreds of vessels have usually sailed from her ports to take and carry away fish which Providence had bountifully brought to our coasts. The herring fishery was regarded as the brightest and most valuable gem which Holland possessed, and the endeavours of this Society have been long directed to assist in placing it in the British Crown.

Great merit attaches to Mr. Francis Fortune, and Mr. Peter Sleavin, for preparing and producing to the Society excellent white herrings, the one from the German Ocean, the other from the Irish Sea.

The

The processes employed by each of them, will be found minutely detailed, and the herrings prepared by both modes were acknowledged by several Dutch Merchants, to be of the first quality.

We have reason to expect that Mr. Fortune will proceed on a very extensive scale with that plan which he has so spiritedly begun.

The Society have received some valuable Communications from several of our Colonies abroad, which will be noticed in a future Volume.

In order that the Plates of the present Volume might be engraved in the very best manner, the Society have been induced to be at a greater expense for their execution than those of the same size in any former Volume.

For the information of the Members, a new edition of the Rules and Orders of the Society are added to the present Volume, that such alterations as have been made within the last five years may be more generally known.

The Society take this opportunity of making acknowledgements for the Presents they have lately received, and which will be found recorded in this Volume.

Their

Their Library has received a valuable addition of Books from Donations and purchase.

THE necessity of placing the REPOSITORY of the Society's MODELS in a condition that would be creditable to themselves and more useful to the public, had been long impressed upon the minds of the Members, but the expense attending such an undertaking being very considerable, and likely to encroach too much on the funds of the Society, the matter remained suspended for some time, till the patriotic spirit of John Christian Curwen, Esq. suggested the propriety of a subscription in aid of the sum voted by the Society out of its general fund, and induced him, with his usual liberality, to contribute Five Guineas for the express purpose of the Improvement of the Repository, and to recommend the measure to be generally adopted by such individual Members as concurred with him in opinion on the advantages which would result from a better disposition of the Models.

His example was soon followed by many Members of the Society, amongst whom the Earl of Radnor, whose noble family hath ever been distinguished for an early, generous, and unremitted attention to the interest of the Society, presented Ten Pounds. The names of the Gentlemen who

have at present subscribed are annexed. Subscriptions continue to be received by the Housekeeper, and Mr. Robert Elwin the Collector; and it may be confidently pronounced, that on the completion of the plan, no other part of Europe will be able to display so valuable and unique a Collection of Models; the gratuitous exhibition of which will be not only highly creditable to the Society, but an honor to the Nation, and of the utmost practical benefit to Agriculturists and Mechanics, by presenting to them, concentrated in one focus, the progress and result of human ingenuity, during upwards of half a century.

List of the present SUBSCRIBERS *to the* REPOSITORY.

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R. H. Solly, Esq.	5	5	0
Lord Henniker.....	2	2	0
Honourable Robert Clifford, VICE PRESIDENT.....	2	2	0
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Thomas Mainwaring, Esq.	2	2	0
E. Mackintosh, Esq.	2	2	0
John Meheux, Esq.	2	2	0
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William Smith, Esq.	2	2	0
Hollis Solly, Esq.	2	2	0
Samuel Solly, Esq.	2	2	0
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R. H. Pepys, Esq.	2	2	0
R. Powell, M. D. VICE PRESIDENT.	2	2	0
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Allen, John Thomas, Esq.	1	1	0
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Antrobus, Philip, Esq.	1	1	0
Amos, James, Esq.	1	1	0
Artbury, William, Esq.	1	1	0
Atkins, John, Esq.	1	1	0
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Baker, Ezekiel, Esq.	1	1	0
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Barton, John, Esq.	1	1	0
Bate, John, Esq.	1	1	0
Beaufoy, Henry, Esq.	1	1	0
Beaumont, Daniel, Esq.	1	1	0

Bennitt, John, Esq.	1	1	0
Blundell, Bezer, Esq.	1	1	0
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Bourdillon, F. Esq.	1	1	0
Brookes, John, Esq.	1	1	0
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Brunel, J. Esq.	1	0	0
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Caddell, David, Esq.	1	1	0
Cardon, Anthony, Esq.	1	1	0
Card, John, Esq.	1	1	0
Cobbett, Pitt, Esq.	1	1	0
Cooke, John Kenworthy, Esq.	1	1	0
Cox, William, Esq.	1	1	0
Cradock, Joseph, Esq.	1	1	0
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Day, John, Esq.	1	1	0
De Ville, John, Esq.	1	0	0
Donkin Bryan, Esq.	1	1	0
Dowson, Emerson, Esq.	1	0	0
Edwards, Hugh,	1	1	0
Farey, John, jun. Esq.	1	1	0
Forbes, L. H. Esq.	1	1	0
Forsyth, J. C. Esq.	1	1	0
Fowler, John, Esq.	1	1	0
Francillion, John, Esq.	1	1	0
French, William, Esq.	1	1	0
Gill, Thomas, Esq.	1	1	0
Gosling, William, Esq.	1	1	0

Gosling, Francis, Esq. 1 1 0
Granes, William, Esq. 1 1 0
Gray, John, Esq. 1 1 0
Green, James, Esq. 1 1 0
Green, Thomas, Esq. 1 1 0

Hawkins, J. J. Esq. 1 1 0
Hayes, Charles, Esq. 1 1 0
Homfray, Samuel, Esq. 1 1 0
Hubbard, J. P. Esq. 1 1 0
Hunt, Robert, Esq. 1 1 0

Johnson, Christopher 1 1 0

Kent, S. L. Esq. 1 0 0
Key, William Cade, Esq. 1 1 0
Kirkby, William, Esq. 1 1 0

Lambert, Charles, Esq. 1 1 0
Langdon, William, Esq. 1 1 0
Lovill, William, Esq. 1 1 0
Low, John, Esq. 1 1 0
Lumley, William, Esq. 1 1 0

Mac Farren, George, Esq. 1 1 0
Madox, John, Esq. 1 1 0
Manley, Rear Admiral, ... 1 0 0
Maudslay, Henry, Esq. 1 1 0
Meredith, George, Esq. 1 1 0
Moore, George, Esq. 1 1 0
Moore, Thomas, Esq. 1 1 0
Moss, James, Esq. 1 1 0

Newcomb, William, Esq. 1 1 0
Nock, Samuel, Esq. 1 1 0

Page, Frederick, Esq.	1	1	0
Parkin, Richard, Esq.	1	1	0
Pearsall, James, Esq.	1	1	0
Pitt, Thomas, Esq. Vice President	1	1	0
Plowman, J. B. Esq.	1	1	0
Porter, Samuel, Esq.	1	1	0
Potticary, John, Esq.	1	1	0
Price, Charles, Esq.	1	1	0
Read, General,	1	1	0
Reeves, John,	1	1	0
Rodes, C. H.	1	1	0
Robinson, John,	1	1	0
Russell, Jesse,	1	1	0
Sheffield, Sir John, Bart.	1	1	0
Salisbury, William, Esq.	1	1	0
Saunders, Thomas, Esq.	1	1	0
Shaw, John, Esq.	1	1	0
Sheffield, W. E. Esq.	1	1	0
Sherborn Thomas, Esq.	1	1	0
Slaton, George, Esq.	1	1	0
Simmonds, John, Esq.	1	1	0
Smith, Jeremiah, Esq.	1	1	0
Smith, John, Esq.	1	1	0
Smith, J. C. Esq.	1	1	0
Smyth, C. T. Esq.	1	1	0
Snuggs, Joseph, Esq.	1	1	0
Stevenson, Joseph, Esq.	1	0	0
Stiff, Thomas, Esq.	1	1	0
Stock, Samuel, Esq.	1	1	0
Sutton, James, Esq.	1	1	0
Taunton, John, Esq.	1	1	0

Taylor,

Taylor, John, Esq.	1	1	0
Tebbs, George, Esq.	1	1	0
Terry, Garnet, Esq.	1	1	0
Travers, Joseph, Esq.	1	1	0
Turpin, James, Esq.	1	1	0
Turner, John, Esq.	1	1	0
Turnbull, John, Esq.	1	0	0
Verrall, Richard, Esq.	1	1	0
Uwins, Zachariah, Esq.	1	1	0
Walker, Thomas, Esq.	1	1	0
Walter, John, Esq.	1	1	0
Walley, Joseph, Esq.	1	1	0
Warren, Charles, Esq.	1	1	0
Wells, Francis, Esq.	1	1	0
White, John, Jun. Esq.	1	1	0
White, Henry, C. Esq.	1	1	0
Wharton, Samuel, Esq.	1	1	0
Whitehead, William, Jun. Esq.	1	0	0
Wilkinson, Thomas, Jun. Esq.	1	1	0
Wilks, Robert, Esq.	1	1	0
Williams, John, Esq.	1	1	0
Wilson, Andrew, Esq.	1	1	0
Wilson, Thomas, Esq.	1	1	0
Wilson, Richard, Esq. Vice President	1	1	0
Woodfall, George, Esq.	1	1	0
George Alexander, Esq.	0	10	6
William Brockeden, Esq,	0	10	6
Rev. Edmund Garden	0	10	6
Edward Matthews, Esq.	0	10	6
Robert Twycross, Esq.	0	10	6
C. A. Busby, Esq.	20	0	0
J. K. Hedges, Esq. Six Plates of Plate Glass			

The

The sum of Twenty Pounds, presented by Mr. Busby, arose from his professional charge to the Society as Architect, for the direction of the improvements in the Model Room, which he handsomely returned towards completing the object. The Plate Glass presented by Mr. Hedges is very valuable, and makes the new doors to the Model Room to correspond in appearance with those in the Society's Great Room. They contribute both to give light to the Hall of the Society, and afford a view of the Model Room from the principal entrance of the House.

It is with great pleasure that we announce the flourishing state of the Society, the valuable additions of Models and Machines in the Repository, and of Books in the Library; probably no other Society with equal funds offers such extensive opportunities of patronage and knowledge to the Members, and of substantial advantages to the Public.

The Society desire it to be clearly understood, that as a body they are not responsible for any opinion or representation of facts contained in the following pages. They have endeavoured only to compress, into a form more concise, such accounts as appeared to them too diffuse when received.

Adelphi, London,
Feb. 29, 1812.

PREMIUMS

OFFERED IN THE YEAR 1811.

BY THE SOCIETY

INSTITUTED FOR THE ENCOURAGEMENT

OF

ARTS, MANUFACTURES, AND COMMERCE,

IN THE ADELPHI, LONDON.

The Meetings of the Society are held at their House in the Adelphi, London; and the Consideration of the Claims, offered in the present List, will take place during the Session of the Society, commencing on the 23d of October, 1811.

PREMIUMS offered in 1811, *by the* SOCIETY *instituted at* London, *A. D.* 1754, *for the Encouragement of Arts, Manufactures, and Commerce, with a List of the present Officers.*

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G. G. L. Marquis of Stafford, K. G.
Jacob, Earl of Radnor, F. R. and A. S.
Robert, Earl of Liverpool, F. R. S.
Charles, Earl of Romney, F. R. S.
Hon. Robert Clifford, F. R. and A. S.
Sir William Dolben, Bart. L. L. D.
Sir Robert Peel, Bart. M. P.
Sir Watkin Lewes, Knt.
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Nathaniel Conant, Esq.
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Abraham Osorio, Esq.

Correspondence and Papers.

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Edward Bancroft, M. D. F. R. S.

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Charles Lambert, Esq. F. A. S.

Agriculture.

Matthias Deane, Esq.
T. H. Andrew, Esq.

Manufactures.

J. Pearsall, Esq.
J. Trelawney, Esq.

Mechanics.

J. Kenworthey Cooke, Esq.
Thomas Gill, Esq.

Chemistry.

Henry Coxwell, Esq.
G. D. Midgley, Esq.

Colonies and Trade.

William Lewis, Esq. F. L. S.
William Vaughan, Esq.

Miscellaneous Matters.

William Kirkby, Esq.
Daniel Beaumont, Esq.

SECRETARY, Charles Taylor, M. D.
ASSISTANT SECRETARY, Mr. Thomas Woodfall.
HOUSEKEEPER, Miss A. B. Cockings.
COLLECTOR, Mr. Robert Elwin.

ADVERTISEMENT TO THE PUBLIC.

THE chief objects of the SOCIETY are to promote the Arts, Manufactures, and Commerce of this Kingdom, by giving honorary or pecuniary Rewards, as seem to them best adapted to the case, for all such useful Inventions, Discoveries, and Improvements, (though not mentioned in this book) as tend to that purpose; and, in pursuance of this plan, the Society have already expended above FIFTY THOUSAND POUNDS, advanced by voluntary subscriptions of their members, and legacies bequeathed.

The Register of the Premiums and Bounties they have given, which may be seen at the SOCIETY's house in the *Adelphi*, will show the very great advantages which the Public have derived from this Institution.

The meetings of the SOCIETY are held every *Wednesday*, at seven o'clock in the evening, from the fourth *Wednesday* in *October* to the first *Wednesday* in *June*. The several Committees meet on other evenings in the week during the session, as particularly mentioned in their printed book of Rules and Orders.

In order still farther to promote the laudable Views of the SOCIETY, it may be necessary to explain the mode by which members are elected.

Each member has the privilege, at the meetings of the SOCIETY, or by letter to the Secretary, to propose any person who is desirous to become a member, provided the proposal contains the name, with the full addition, and place of abode, of the proposed member, and is signed by three members of the SOCIETY.

Peers of the Realm or Lords of Parliament are, on their being proposed, immediately balloted for; the names of other persons proposed to become Members are to be delivered to the Secretary, read at the next meeting of the SOCIETY, and then inserted in lists which are hung up in the Society's room: they are balloted for at the second following ordinary meeting. In both cases, if two-thirds of the members then voting ballot in their favour, they are deemed perpetual members upon payment of not less than Twenty Guineas in one sum, or subscribing members upon payment of any sum not less than Two Guineas annually.

All members are entitled to vote and assist in all the business of the SOCIETY, and the several Committees. The members have also the privilege of recommending two persons as auditors at the meetings of the SOCIETY, and by addressing a note to the housekeeper, of introducing their friends to examine the various Models, Machines, and Productions, in different branches of Arts, Manufactures, and Commerce, for which rewards have been bestowed; also to inspect the magnificent series of moral and historical Paintings, executed by the late J. BARRY, Esq. which, with some valuable Busts, Statues, &c. decorate the Great Room.

Members have the use of the Society's Library, which is valuable and annually increasing, from donations of scientific and useful books and engravings. The SOCIETY are highly sensible of the great importance of such acquisitions, and are happy to record them, with the names of the donors, in the Volume annually published of the SOCIETY's Transactions, to which the members are entitled.

Ladies are eligible, as members of the SOCIETY, to all the Privileges thereof, and are alone entitled to vote by proxy at elections, through the medium of any gentleman who is a member, on his producing a written authority for the same.

The time appointed for admission to the Paintings or Models, is from ten to two o'clock, Sundays and Wednesdays excepted.

ORDERED, SOCIETY'S HOUSE, ADELPHI, JUNE 1st, 1811.

That the several Candidates and Claimants, to whom the Society shall adjudge Premiums or Bounties, do attend at the Society's House, in the Adelphi, on the last Tuesday, in May, 1812, at Eleven o' Clock in the Morning precisely, to receive the same; that Day being appointed by the Society for the Distribution of their Rewards: And before that time no Premium or Bounty will be delivered, except to those who are about to leave the Kingdom.

In cases where the Society may think fit to admit excuses for not attending in person, deputies may be substituted to receive the Rewards, provided such Deputies are either Members of the Society, or superior Officers thereof.

PREMIUMS IN AGRICULTURE.

The candidates for planting all kinds of trees are to mention the nature of the soil, to produce certificates that the respective plantations are properly fenced and secured, and particularly to state the condition of the plants at the time of signing such certificates. Any information which the candidates for the following premiums may choose to communicate, relative to the methods made use of in forming the plantations, or promoting the growth of the several trees, or any other observations that may have occurred on the subject, will be thankfully received.

It is the intention of the Society, that such lands only as are not calculated for the purposes of Husbandry, should be employed for the purposes specified in these advertisements relative to plantations.

Article 1. ACORNS.

FOR having set between the first of October, 1809, and the first of April, 1810, the greatest quantity of land, not less than ten acres, with acorns, with or without seeds, cuttings, or plants of other trees, at the option of the candidate; and for effectually fencing and preserving the same, in order to raise timber; the gold medal.

2. For the second greatest quantity of land, not less than five acres, set agreeably to the above conditions; the silver medal.

Certificates of setting agreeably to the above conditions, and that there are not fewer than three hundred young oaks on each acre, to be delivered to the Society on or before the first Tuesday in December, 1811.

3. RAISING OAKS. To the person who shall have raised, since the year 1807, the greatest number of oaks, not fewer than five thousand, either from young plants or acorns, in order to secure a succession of oak timber in this kingdom; the gold medal.

4. For the next greatest number, not fewer than three thousand; the silver medal.

Certificates that there were on the land, at least the number of young oak trees required, in a thriving condition, two years after the planting, with an account of the methods pursued in making and managing the plantation, to be produced to the Society on or before the first Tuesday in January, 1812.

5. ASCERTAINING THE BEST METHOD OF RAISING OAKS. To the person who shall ascertain in the best manner, by actual experiments, the comparative merits of the different modes of raising oaks for timber, either from acorns set on land properly dug or tilled, from acorns set by the spade or dibble, without digging or tillage, either on a smooth surface, or among bushes, fern, or other cover: or from young plants previously raised in nurseries, and transplanted; regard being had to the expense, growth, and other respective advantages of the several methods; the gold medal.

The *accounts* and proper *certificates*, that not less than one acre has been cultivated in each mode, to be produced to the Society on or before the first Tuesday in November, 1811.

6. CHESNUTS. For having sown or set, between the first of October, 1809, and the first of April, 1810, the greatest quantity of land, not less than six acres, with Spanish chesnuts, with or without seeds, cuttings, or plants of other trees, adapted to such soil, at the option of the candidate; and for effectually fencing and preserving the same, in order to raise timber; the gold medal.

7. For the second greatest quantity, not less than four acres; the silver medal.

Certificates of sowing or setting, agreeably to the above conditions, and that there are not fewer than three hundred chesnut plants in a thriving state, on each acre, to be delivered to the Society on or before the first Tuesday in January, 1812.

8. ELM. For having planted the greatest number of the English elm, not less than eight thousand, between the twenty-fourth of June, 1809, and the twenty-fourth of June, 1810; and for having effectually fenced and preserved the same in order to raise timber: the gold medal.

9. For the second greatest number, not less than five thousand; the silver medal.

Certificates of having planted agreeably to the above conditions, that the plants were in a healthy and thriving state two years at least after making the plantation, and specifying the distance of the plants, to be delivered to the Society on or before the first Tuesday in April, 1812.

10. LARCH. For having planted out, between the twenty-fourth of June, 1808, and the twenty-fourth of June, 1809, the greatest number of larch trees, not fewer than five thousand, and for having effectually fenced and preserved the same in order to raise timber; the gold medal.

11. For the next greatest number, not fewer than three thousand; the silver medal.

Certificates of the number of plants, that they were in a healthy and thriving state two years at least after they were planted out, with a general account of the methods used in making the plantation, to be delivered to the Society on or before the last Tuesday in December, 1811.

N. B. The larch trees may be planted, either mixed with other trees, or by themselves, as may best suit the convenience of the planter.

12. ASH. For having sown or set, in the year 1807, the greatest quantity of land, not less than six acres, with ash for timber, with or without seed, cuttings, or plants, of such other trees as are adapted to the soil; the gold medal.

13. For the next greatest quantity, not less than four acres; the silver medal.

Certificates of the sowing or setting, agreeably to the above conditions, that there are not fewer than six hundred ash plants on each acre, in a thriving and healthy

condition, two years at least after the sowing or setting, with a general account of the methods used in making the plantation; to be delivered to the Society on or before the last Tuesday in December, 1811.

14. Forest trees. To the person who shall have enclosed and planted, or set, the greatest number of acres (not less than ten) of land, that is incapable of being ploughed, such as the borders of rivers, the sides of precipices, and any land that has too many rocks, or that is not calculated to repay the expense of tillage, owing to the surface being too hilly, mountainous, or otherwise unfit for tillage, with the best sorts of forest trees, namely, oak, Spanish chesnuts, ash, elm, beech, alder, willow, larch, spruce, and silver fir, with or without screens of Scotch fir, adapted to the soil, and intended for timber trees, between the first of October, 1808, and the first of April, 1809; the gold medal.

15. For the second greatest quantity of land, not less than seven acres; the silver medal.

A particular *account* of the methods used in making and managing the plantations, the nature of the soil, the probable number of each sort of plants, together with proper *certificates* that they were in a healthy and thriving state two years at least after making the plantation, to be delivered to the Society on or before the first Tuesday in December, 1811.

N. B. With the above forest trees, the seeds, cuttings, or plants, of such other trees as are adapted to the soil, and proper for underwood, may or may not be intermixed.

16. Norway Fir Seedlings. To the person who shall have planted in the united kingdom, during the year 1811, the greatest number, not less than two thousand, of red wood and white wood, Norway fir seedlings, at sufficient distances from each other, to stand for timber trees; the gold medal.

Certificates of the number of plants, that they were in a thriving state two years at least, after they were planted out, with a general account of the method used in making the plantation, to be delivered to the Society, on or before the first Tuesday in December, 1814.

N. B. It is recommended to plant the seedlings of about three or four years growth, and in a moderately good soil, somewhat sheltered; the wood from the district of Christiania is esteemed the best for carpenters and joiners use; and for spars and upers the trees near to Long Sound, are most valued.

17. Walnut Trees. For having planted the greatest number of walnut trees, not less than five hundred, between the 24th of June, 1809, and the 24th of June, 1810, and for having effectually fenced and preserved the same, in order to raise timber; the gold medal.

18. For the next greatest number, not fewer than three hundred; the silver medal.

Certificates of having planted agreeably to the above conditions, and that the plants were in a healthy and thriving state, two years at least after making the plantations, and specifying the distance of the plants from each other, to be delivered to the Society, on or before the first Tuesday in April, 1812.

19. Securing Plantations of Timber Trees, and Hedge Rows. To the person who shall give to the Society the most satisfactory account, founded on experience, of the most effectual and least expensive method of securing young plantations of timber trees, and hedge rows, from hares and rabbits, as well as sheep and large cattle, which at the same time shall be least subject to the depredations of wood-stealers; the silver medal.

The *accounts*, and *certificates* of the efficacy of the method, to be produced to the Society on or before the first Tuesday in December, 1811.

20. Comparative Culture of Wheat, broad-cast, drilled, and dibbled. For the best set of experiments, made on not less than twelve acres, four of which to be sown broad-cast, four drilled, and four dibbled, the two latter in equidistant rows, in order fully to ascertain which is the most advantageous mode of cultivating wheat; the gold medal.

It is required that every operation and expense of each mode of culture be fully described: and that proper *certificates* of the nature and condition of the land on which the experiments were made, together with an *account* of the produce of the corn, the weight per bushel, and also of the straw, be produced to the Society on or before the first Tuesday in February, 1812.

21. Beans and Wheat. To the person who shall have dibbled or drilled between the first of December, 1810, and the first of April, 1811, the greatest quantity of land, not less than ten acres, with beans, in equidistant rows, and hoed the intervals twice or oftener, and shall have sown the same land with wheat in the autumn of the year 1810; the gold medal.

It is required that an *account* of the sort and quantity of beans, the time of dibbling or drilling, and of reaping or mowing them, the produce per acre thrashed, the expense of dibbling or drilling, hand or horse hoeing, the distance of the rows, and the quality of the soil, together with *certificates* of the number of acres, and that the land was afterwards actually sown with wheat, be produced on or before the second Tuesday in March, 1812.

22. Beans. To the person who, in the year 1810, shall discover and cultivate, either by the drill or dibbling method, on not less than five acres, a species of horse-beans or tick-beans, that will ripen their seeds before the 21st of August; the silver medal.

It is required that a particular account of the bean, the cultivation, and the expense attending it, with proper *certificates* of the

nature and condition of the land on which the experiments were made, together with an *account* of the produce, the weight per Winchester bushel, and a sample of not less than a peck, be produced to the Society on or before the first Tuesday in December, 1811. It is apprehended that if a bean should be brought into cultivation with the habits of the hotspur, or other early peas, that it would in a great measure escape the danger arising from the collier-insect, or other insects, and allow more time for the farmers to till the land for the subsequent crop of wheat. The *accounts* and *certificates* to be delivered on or before the first Tuesday in December, 1811.

23. Parsnips. To the person who in the year 1810, shall cultivate the greatest quantity of land, not less than five acres, with parsnips, for the sole purpose of feeding cattle or sheep; the gold medal.

Certificates of the quantity of land so cultivated, with a particular *account* of the nature of the soil and weight of the produce on sixteen perches, and also of the condition of the cattle or sheep fed with the parsnips, and the advantages resulting from the practice, to be produced to the Society on or before the second Tuesday in February, 1812.

24. Buck Wheat. To the person who shall cultivate the greatest quantity of land with buck wheat, not less than thirty acres; the gold medal.

It is required that the time of sowing and reaping be noticed; also a particular *account* of the species, cultivation, and expense attending it, the manner of reaping it, thrashing it, and housing the grain; with proper *certificates* of the nature and condition of the land on which the experiments were made, and the name of the crop, if any, which the same land bore the preceding year, together with an *account* of the produce, and a sample of the seed, not less than a quart, be produced to the Society on or before the second Tuesday in January, 1812.

25. For the next greatest quantity, not less than fifteen acres, on similar conditions; the silver medal.

Information respecting its application to the feeding of cattle, hogs, and poultry, and other of its uses, is also desired. It is known to be particularly serviceable in furnishing honey to bees.

26. Bees, Wax, and Honey. To the person who shall erect, previous to the first day of September, 1811, an apiary containing the greatest number of hives or boxes stocked with bees, not less than thirty; the silver medal, or twenty guineas.

27. For the next greatest number, not fewer than twenty stocks; ten guineas.

Proper *certificates* of the number of stocks, and that they have been in the possession of the claimant during the preceding summer, to be produced to the Society on or before the first Tuesday in March, 1812.

28. Raising Grass Seeds. To the person who shall raise the greatest quantity of each of any of the following named grass seeds, *viz.*—Meadow fox-tail (alopecurus pratensis), sweet-scented vernal grass (anthoxanthum odoratum), Timothy grass (phleum pratense), meadow fescue grass (festuca pratensis), smooth-stalked meadow grass (poa pratensis), rough-stalked meadow grass (poa trivialis); the silver medal.

It is required that *certificates* from persons who have viewed them in a proper state, to identify that they are one or other of the seeds above-mentioned, indicating clearly the particular species, and noticing the quantity produced of such seeds, free from weeds or mixture of other grasses, together with proper samples of the seeds, be produced to the Society on or before the first day of February, 1812.

29. Preserving Turnips. To the person who shall discover to the Society the best and cheapest method of preserving turnips perfectly sound, and in every respect fit for the purpose of supporting and fattening sheep and neat cattle during the months of February, March, and April; the gold medal.

It is required that a full and accurate *account* of the method employed, and the expense attending the process, together with *certificates* that the produce of four acres at the least have been preserved according to the method described, and applied to the feeding of sheep and neat cattle; that the whole were drawn out of the ground before the first day of February, in order to clear the greater part of it previous to its being prepared for corn, and to save the soil from being exhausted by the turnips; and also of the weight of an average sixteen perches of the crop; be produced to the Society on or before the first Tuesday in December, 1811.

30. For the next in quantity and merit, on not less than two acres; the silver medal.

31. Preserving Cabbages. To the person who shall discover to the Society the best and cheapest method of preserving drum-headed cabbages perfectly sound, and in every respect fit for the purpose of supporting and fattening sheep and neat cattle during the months of February, March, and April; the gold medal.

32. For the next in quantity and merit, on not less than two acres; the silver medal.

Conditions the same as for preserving turnips, Art. 29.—And the *accounts* to be produced on or before the first Tuesday in December, 1811.

33. Preserving Carrots, Parsnips, or Beets. To the person who shall discover to the Society the best and cheapest method of preserving carrots, parsnips, or beets, perfectly sound, and in every respect fit for the purpose of supporting horses, and fattening sheep and neat cattle, during the

months of February, March, and April; the gold medal.

Conditions the same as for preserving turnips, Art. 29.—And the *accounts* to be delivered in on or before the first Tuesday in December, 1811.

34. For the next in quantity and merit, on not less than two acres; the silver medal.

35. Preserving Potatoes. To the person who shall discover to the Society the best and cheapest method of preserving potatoes, two or more years, perfectly sound, without vegetating, and in every other respect fit for the purpose of sets and the use of the table, and consequently of supporting and fattening cattle; the gold medal, or thirty guineas.

It is required that a full and accurate *account* of the method employed, and the expense attending the process, with *certificates* that one hundred bushels at the least have been preserved according to the method described, and that one or more bushels of the same potatoes have been set, and produced a crop without any apparent diminution of their vegetative power, and also that they have been used at table, with entire satisfaction to the person who eat of them, together with a sample of one bushel, be sent to the Society on or before the first Tuesday in December, 1811.

36. For the next greatest quantity, not less than fifty bushels; the silver medal.

37. Making Meadow-Hay in wet Weather. To the person who shall discover to the Society the best and cheapest method, superior to any hitherto practised, of making meadow-hay in wet weather; the gold medal.

A full *account* of the method employed, and of the expense attending the process, with not less than fifty-six pounds of the hay; and *certificates* that at least the produce of six acres of land has been made according to the method described, and that the whole is of equal quality with the sample; to be produced on or before the first Tuesday in January, 1812.

38. Harvesting Corn in wet Weather. To the person who shall discover to the Society the best and cheapest method, superior to any hitherto practised, of harvesting corn in wet weather; the gold medal.

A full *account* of the method employed, and of the expense attending the process, with not less than two sheaves of the corn, and *certificates* that at least the produce of ten acres has been harvested according to the method described, and that the whole is of equal quality with the samples, to be produced on or before the first Tuesday in January, 1812.

39. Gaining Land from the Sea. To the person who shall produce to the Society an account, verified by actual experiment, of his having gained the greatest quantity of land from the sea, not less than fifty acres, on the coast of Great Britain and Ireland; the gold medal.

Certificates of the quantity of land, and that the experiments were begun after the first of January, 1806, to be produced to the Society on or before the last Tuesday in November, 1811.

40. The same premium is extended one year further.

Certificates to be produced on or before the last Tuesday in November, 1812.

41. Improving Land lying Waste. For the most satisfactory *account* of the best method of improving any one of the following soils, being land lying waste or uncultivated, *viz.* clay, gravel, sand, chalk, peat earth, or bog, verified by experiments on not less than fifty acres of land; the gold medal.

42. For the next greatest quantity, not less than thirty acres; the silver medal.

It is required, that the land, before such improvement, be absolutely uncultivated, and in a great measure useless, and that, in its improved state, it be enclosed, cultivated, and divided into closes.

Certificates of the number of acres, of the quality of the land so improved, with a full *account* of every operation and expense attending such improvement, the state it is in as to the proportion of grass to arable, and the average value thereof, to be produced on or before the first Tuesday in February, 1812.

43. Manures. For the most satisfactory set of experiments, to ascertain the comparative advantages of the following manures, used as top-dressings on grass and corn land, *viz.* soot, coal-ashes, wood-ashes, lime, gypsum, night-soil, or any other fit article; the gold medal.

It is required that the above experiments be made between two or more of the above-mentioned manures, and that no less than two acres of land be dressed with each manure.

An *account* of the nature of the soil, quantity, and expense of the manure and crops, with *certificates*, to be produced on or before the last Tuesday in February, 1812.

44. Raising Water for the irrigation of Land. To the person who shall discover to the Society the cheapest and most effectual method of raising water in quantities sufficient to be beneficially employed for the purpose of irrigating land, superior to, and cheaper than any other method now in use; the gold medal, or fifty guineas.

A model, on a scale of one inch to a foot, with *certificates* that a machine at large, on the same construction, has been used, specifying the quantity of water delivered in gallons per hour, and the height to which it was raised, to be produced to the Society on or before the first of March, 1812.

45. Paring Plough. To the person who shall invent and produce to the Society

a machine or plough for the purpose of paring land preparatory to burning, superior to any hitherto known, or in use for such purpose, and to be worked by not more than one man and two horses; the silver medal, or twenty-guineas.

The machine, and *certificates* that at least three acres have been pared by it in a proper manner, to be produced to the Society on or before the first of January, 1812.

46. Machine for Dibbling Wheat. To the person who shall invent a machine, superior to any hitherto known or in use, to answer the purpose of dibbling wheat, by which the holes for receiving the grain may be made at equal distances and proper depths; the silver medal and ten guineas.

The *machine*, with *certificates* that at least three acres have been dibbled by it, to be produced to the Society on or before the second Tuesday in January, 1812.

47. Machine for Reaping or Mowing Corn. For inventing a machine to answer the purpose of mowing or reaping wheat, rye, barley, oats, or beans, by which it may be done more expeditiously and cheaper than by any method now practised, provided it does not shed the corn or pulse more than the methods in common practice, and that it lays the straw in such a manner that it may be easily gathered up for binding; the gold medal.

The *machine*, with *certificates* that at least three acres have been cut by it, to be produced to the Society on or before the second Tuesday in December, 1811. Simplicity and cheapness in the construction of this and the preceding machine, will be considered as principal parts of their merit.

48. Thrashing Machine. To the person who shall invent a machine by which corn of all sorts may be thrashed more expeditiously, effectually, and at a less expense, than by any method now in use; the gold medal.

The *machine*, or a model, with proper *certificates* that such a machine has been usefully applied, that at least thirty quarters have been thrashed by it, and of the time employed in the operation, to be produced to the Society on or before the last Tuesday in February, 1812.

49. Destroying the Grub of the Cockchafer. To the person who shall discover to the Society an effectual method, verified by repeated and satisfactory trials, of destroying the grub of the cockchafer, or of preventing or checking the destructive effects which always attend corn, peas, beans, and turnips, when attacked by those insects; the gold medal.

The *accounts*, with proper *certificates*, to be produced on or before the first Tuesday in January, 1812.

50. Destroying Worms. To the person who shall discover to the Society an effectual method, verified by repeated and satisfactory trials, of destoying worms, or of preventing the destructive effects they occasion on corn, beans, peas, or other pulse; the silver medal.

The *accounts*, with proper *certificates*, to be produced to the Society on or before the first Tuesday in January, 1812.

51. Destroying the Fly on Hops. To the person who shall discover to the Society an easy and efficacious method of destroying the fly on hops, superior to any hitherto known or practised, on not less than four acres of hop ground; the gold medal.

Accounts and *certificates* to be delivered to the Society on or before the first Tuesday in February, 1812.

52. Preventing the Blight, or Ravages of Insects, on Fruit Trees and Culinary Plants. To the person who shall discover to the Society the most effectual method of preventing the blight or ravages of insects on fruit-trees and culinary plants, superior to any hitherto known or practised, and verified by actual and comparative experiments; the silver medal.

The *accounts*, with proper *certificates*, to be delivered to the Society on or before the second Tuesday in December, 1811.

53. Cure of the Rot in Sheep. To the person who shall discover to the Society the best and most effectual method of curing the rot in sheep, verified by repeated and satisfactory experiments; the gold medal.

It is expected that the candidates furnish accurate *accounts* of the symptoms and cure of the disease, together with the imputed cause thereof, and the actual or probable means of prevention, which, with proper *certificates*, must be delivered to the Society on or before the first Tuesday in February, 1812.

54. Cure of the Foot-Rot in Sheep. To the person who shall discover to the Society the best and most effectual method of curing the foot-rot in sheep; the silver medal.

It is required that the cure be ascertained by repeated and satisfactory experiments, and the method of performing it be verified by proper *certificates* delivered to the Society on or before the first Tuesday in February, 1812.

55. Preventing the ill Effects of Flies on Sheep. To the person who shall discover to the Society the most effectual method of protecting sheep from being disturbed and injured by flies; the silver medal.

It is required that the method be ascertained by repeated experiments, and that a *certificate* of its efficacy be delivered to the Society on or before the first Tuesday in December, 1811.

56. Protecting Sheep. To the person who, in the year 1810, shall protect the greatest number of sheep, not fewer than one hundred, by hovels, sheds, or any other means, and give the most satisfactory ac-

count, verified by experiment, of the advantages arising from the practice of protecting sheep from the inclemency of the weather, by hovels, sheds, or any other means; the gold medal.

A particular *account* of the experiments made, with the advantages arising therefrom, together with the expense, and *certificates* of its utility, to be produced to the Society on or before the first Tuesday in March, 1812.

N. B. It is required that the *certificates* shall specify the length of time the sheep were so protected, and the manner in which they were maintained during that time; together with the general method of managing them.

57. Culture of Hemp. The Society wishing to encourage the growth of hemp for the use of the navy in every part of the united Empire, offer to the person who shall sow with hemp, in drills at least eighteen inches asunder, the greatest quantity of land in any part of the united Empire, not less than fifty acres statute measure, in the year 1811, and shall at the proper season cause to be plucked the summer hemp, (or male hemp bearing no seed) and continue the winter hemp (or female hemp bearing seed) on the ground until the seed is ripe; the gold medal.

58. To the person who shall sow with hemp, in drills at least eighteen inches asunder, the next greatest quantity of land in any part of the united Empire, not less than twenty-five acres, statute measure, in the year 1811, and shall at the proper season cause the same to be plucked as abovementioned; the silver medal.

Certificates of the number of acres, of the distance of the drills, of the plucking of the hemp, with a general *account* of the soil, cultivation, and produce, to be delivered to the Society, along with fourteen pounds of the hemp and two quarts of the seed, on or before the second Tuesday in January, 1812.

59. Feeding of Cattle. For the best experiments on stall feeding of cattle (not less than five head) to be continued for the space of twelve months, in order to prove the earliest maturity and greatest propensity to fatten, of the most approved breeds of cattle in Great Britain, specifying the nature of the food given, together with the daily consumption of each beast, with its weekly increase in weight, and such other observations as may be deemed of consequence; the gold medal.

A full *account* of the methods employed, and of the expenses attending the same, and *certificates* of the sundry matters stated, to be produced on or before the second Tuesday in January, 1812.

PREMIUMS FOR DISCOVERIES AND IMPROVEMENTS IN CHEMISTRY, DYEING, AND MINERALOGY.

60. Preserving Seeds of Vegetables. For the best method of preserving the Seeds of plants in a state fit for vegetation a longer time than has hitherto been practised, such method being superior to any known to the public, and verified by sufficient trial, to be communicated to the Society on or before the first Tuesday in December, 1811; the gold medal, or thirty guineas.

61. Preventing the Dry-Rot in Timber. To the person who shall discover to the Society the cause of the dry-rot in timber, and disclose a certain method of prevention superior to any hitherto known; the gold medal, or thirty guineas.

The *accounts* of the cause, and method of prevention, confirmed by repeated experiments, to be produced to the Society on or before the second Tuesday in Dec. 1811.

62. Preserving salted Provisions from becoming rancid or rusty. To the person who shall discover to the Society the best, cheapest, and most efficacious method of preserving salted provisons from becoming rancid or rusty; the gold medal, or thirty guineas.

A full *description* of the method, with proper *certificates* that it has been found on repeated trials to answer the purpose intended, to be produced to the Society on or before the first Tuesday in February, 1812.

63. Refining Whale or Seal Oil. For disclosing to the Society an effectual method of purifying whale or seal oil from the glutinous matter that incrusts the wicks of lamps, and extinguishes the light though fully supplied with oil; the gold medal, or fifty guineas.

It is required that the whole of the process be fully and fairly disclosed, in order that satisfactory experiments may be made by the Society to determine the validity of the claim; and *certificates* that not less than twenty gallons have been purified according to the process delivered in, together with two gallons of the oil, in its unpurified state, and two gallons so refined, to be produced to the Society on or before the second Tuesday in February, 1812.

64. Manufacturing Tallow Candles. To the person who shall discover to the Society a method of hardening or otherwise preparing tallow, so that candles may be made of it which will burn as clear and with as small a wick as wax candles, without running, and may be afforded at a less expense than any at present made with spermaceti; the gold medal, or fifty guineas.

Certificates that 112lb. of such tallow have been made into candles, and 12lb. of the candles made thereof, to be produced to the Society on or before the Second Tuesday in January, 1812.

65. Candles from Resin or other Substances. To the person who shall discover to the Society the best method of making candles of resin, or any other substance, fit for common use, at a price much inferior to those made of tallow only; the gold medal, or thirty guineas.

Six pounds at least of the candles so prepared, with an *account* of the process, to be delivered to the Society on or before the first Tuesday in December, 1811.

66. Method of separating Sugar in a solid Form from Treacle. To the person who shall discover to the Society the best method of separating sugar from treacle, in a solid form, at such an expense as will render it advantageous to the public; the gold medal, or fifty guineas.

A quantity of the sugar so prepared, in a solid form, not less than thirty pounds weight, with an *account* of the process, and *certificates* that not less than one hundred weight has been so prepared, to be produced to the Society on or before the first Tuesday in February, 1812.

67. Increasing Steam. To the person who shall invent and discover to the Society a method, verified by actual experiments, of increasing the quantity or force of steam, in steam-engines with less fuel than has hitherto been employed, provided that in general the whole amount of the expences in using steam-engines may be considerably lessened; the gold medal, or thirty guineas.

To be communicated to the Society on or before the first Tuesday in January, 1812.

68. Substitute for Tar. To the person who shall invent and discover to the Society the best substitute for Stockholm tar, equal in all its properties to the best of that kind; and prepared from materials the produce of the united Kingdom and its Colonies; the gold medal, or one hundred guineas. A quantity of the substitute, not less than one hundred weight, with *certificates* that at least one ton has been manufactured, and that it can be afforded at a price not exceeding that of the best foreign tar, together with an *account* of the process, to be delivered to the Society on or before the first Tuesday in March, 1812.

69. Turpentine from the Scotch Fir or Pinus Sylvestris. For the greatest quantity of turpentine, not less than two hundred weight prepared in Great Britain from that species of fir called the Scotch fir, or Pinus sylvestris, Linn.; the gold medal.

Certificates of the turpentine being prepared from such trees of British growth, together with fifty-six pounds of the turpentine, to be delivered to the Society on or before the second Tuesday in January, 1812.

70. For the next greatest quantity prepared, not less than one hundred weight, on similar conditions; the silver medal.

N. B. The Society being in possession of the method practiced for extracting turpentine from the trees whilst growing, and of samples so procured, information will be given upon the subject, on application for that purpose, at the Society's house.

71. Preparation of Tan. To the person who shall prepare, in the most concentrated form, so as to be easily portable, and at a price applicable to the purposes of manufacturers, the largest quantity, not less than one hundred weight of the principle called by the French *tannin*, which abounds in oak-bark and many other vegetable substances; the gold medal, or thirty guineas.

Certificates of the superior quality of the quantity so prepared, and a sample of not less than 28lb. to be produced to the Society on or before the last Tuesday in January, 1812.

72. Indelible Ink. To the person who shall discover to the Society a method of making a black ink proper for writing, superior to any at present known, indestructible by chemical applications, and not dearer than that which is now in common use; the silver medal, or fifteen guineas.

Certificates that not less than two gallons of such ink have been actually prepared, and found to possess the qualities above-mentioned, with a full detail of the process of making it, and two quarts of the ink to be delivered to the Society on or before the second Tuesday in January, 1812.

73. Preparation of a red Stain for Cotton Cloth. To the person who shall communicate to the Society the cheapest and most effectual method of printing or staining cotton cloths with a red colour, by an immediate application of the colouring matter to the cloth, equally beautiful and durable with the red colours now generally procured from decoctions of madder; the gold medal, or fifty guineas.

Certificates that the above process has been advantageously used on ten pieces of calico, each twenty-one yards or upwards in length; one piece of the calico so printed, a quart of the colour in a liquid state, and a full *account* of the preparation and application to be produced to the Society on or before the second Tuesday in January, 1812.

74. Preparation of a green Colour for printing cotton Cloth. To the person who shall communicate to the Society the best and cheapest method of printing with a full green colour on cotton cloth, by an immediate application of the colouring matter from a wooden block to the cloth, equally beautiful and durable as the colours now formed from the complicated process of the decoction of weld on alumine, and the solutions of indigo by earths or alkaline salts; the gold medal, or fifty guineas.

Certificates and conditions as for Premium 73.

75. Rendering Muslin less Combustible. To the person who shall discover to the Society a method of rendering muslin

less combustible, to be effected by a cheaper and more effectual mode than any hitherto known; the silver medal.

Specimens of the muslin so prepared, with a full account of the process employed for the purpose, to be produced to the Society on or before the first Tuesday in February, 1812.

N. B. It is expected that the means employed shall neither injure the quality of the muslin, stain it, nor damage any print or dye with which it may be coloured.

76. White Substance for the Basis of Paint. To the person who shall produce to the Society the best substitute, superior to any hitherto known, for the basis of paint, equally proper for the purpose as the white-lead now employed; such substitute not to be of a noxious quality, and to be afforded at a price not materially higher than that of white-lead, the gold medal, or one hundred guineas.

A quantity of the substitute, not less than 50lb. weight, with an *account* of the process used in preparing it, and *certificates* that at least one hundred weight has been manufactured, to be produced to the Society on or before the first Tuesday in January, 1812.

77. Red Pigment. To the person who shall discover to the Society a full and satisfactory process for preparing a red pigment, fit for use in oil or water, equal in tone and brilliancy to the best carmines and lakes now known or in use, and perfectly durable; the gold medal, or fifty guineas.

One pound weight of such colour, and a full disclosure of its preparation, to be produced to the Society on or before the first Tuesday in February, 1812.

N. B. It is not required that the colour should resist the action of fire, or chemical applications, but remain unaltered by the common exposure to strong light, damps, and noxious vapours.

78. Ultramarine. To the person who shall prepare an artificial ultramarine, equal in colour, brilliancy, and durability, to the best prepared from lapis lazuli, and which may be afforded at a cheap rate; the gold medal, or thirty guineas.

The conditions are the same as in the preceding Premium for the red pigment.

79. Blue Pigment from Iron. To the person who shall invent, and discover to the Society, the best blue pigment from iron, superior to Antwerp or Prussian blue in colour and durability, fit for use in oil or water, which may be afforded at a cheap rate; the gold medal, or thirty guineas.

One pound weight of the colour, and a full disclosure of its preparation, to be produced to the Society on or before the first Tuesday in February, 1812.

N. B. It appears from the analysis of lapis lazuli by Klaproth, and the experiments of Guyton, (related in the Annales de Chemie) that ultramarine is a blue sulphurat of iron, and that a blue substance much resembling it is constantly found amongst the scoriæ of blast furnaces where iron is reduced. The Society by offering the above premium wish to call the attention of persons to these facts, and encourage them to make experiments, in the hope of producing a blue pigment which may be substituted for ultramarine.

80. Destructive Effects from Moths. To the person who shall discover to the Society a cheap, easy, and effectual method, verified by repeated and satisfactory trials, of preventing the destructive effects occasioned by moths and other insects, in furs, woollens, and other articles, superior to any hitherto known or practised; the silver medal, or fifteen guineas.

The *accounts*, with proper *certificates*, to be produced to the Society on or before the first Tuesday in January, 1812.

81. Statuary Marble. To the person who shall discover, within Great Britain or Ireland, a quarry of white marble fit for the purposes of statuary, and equal in all respects to those kinds now imported from Italy; the gold medal, or one hundred guineas.

A block of at least three feet in length, two in height, and two in width, with an account of the situation of the quarry, and *certificates* of its possessing considerable extent, to be produced to the Society on or before the first Tuesday in February, 1812.

N. B. In order to prevent useless expense or trouble to the claimant in forwarding so large a block, the Society will be ready to examine any smaller specimen of the marble, and express their opinion of its value to the candidate before the block required by the above premium is produced.

82. Preparation of Sulphuric Acid, from Sulphur without the Use of any Nitric Salt. To the person who shall prepare the largest quantity (not less than one ton) of sulphuric acid from sulphur without any nitric salt, of a specific gravity not inferior to the best sulphuric acid of commerce; the gold medal, or fifty guineas.

Certificates that not less than the above quantity of such an acid has been prepared, together with a sample, to be produced to the Society on or before the first Tuesday in January, 1812.

83. Preparation of any Alkaline or Earthen Nitrate. To the person who shall prepare, in Great Britain, the largest quantity, not less than one hundred weight, of any salt of nitric acid, with either earths or alkalis, by a method superior to, and as cheap as those hitherto practised; the gold medal, or one hundred guineas.

Certificates of the above quantity having been prepared, and a sample of not less than 28lb. to be produced to the Society on or before the last Tuesday in January, 1812.

84. Fine Bar Iron. To the person, in Great Britain, who shall make the greatest quantity of bar-iron, not less than ten tons

with coak, from coak pigs, equal in quality to the best iron imported from Sweden or Russia, and as fit for being converted into steel; the gold medal, or fifty guineas.

Samples, not less than one hundred weight, with *certificates* that the whole quantity is of equal quality, to be produced to the Society on or before the first Tuesday in January, 1812.

85. Preserving Iron from Rust. To the person who shall invent and discover to the Society a cheap composition, superior to any now in use, which shall effectually preserve wrought iron from rust; the gold medal, or fifty guineas.

A full description of the method of preparing the composition, with *certificates* that it has stood at least two years unimpaired, being exposed to the atmosphere during the whole time, to be produced to the Society, with ten pounds weight of the composition, on or before the first Tuesday in January, 1812.

86. Refining Block Tin. To the person who shall discover to the Society the best method of purifying or refining block-tin, so as to render it fit for the finest purposes to which grain-tin is now applied, and not higher in price; the gold medal, or fifty guineas.

Certificates that not less than three tons have been so refined or purified, with a full detail of the process, and a quantity, not less than one hundred weight, of the tin so refined, to be produced to the Society on or before the first Tuesday in January, 1812.

87. Glazing Earthen-Ware without Lead. To the person who shall discover to the Society the cheapest, safest, most durable, and most easily fusible composition, fit for the purpose of glazing the ordinary kinds of earthen-ware, without any preparation of lead, and superior to any hitherto in use; the gold medal, or thirty guineas.

Specimens of the ware so glazed, with proper *certificates* of its having succeeded, and a sample of the materials made use of, to be produced to the Society on or before the first Tuesday in February, 1812.

88. Cobalt, Zaffre, and Smalt. For the discovery of a mine of cobalt in Great Britain or Ireland, that will produce a sufficient quantity of the mineral, of good quality, to supply a manufacture of Zaffre or Smalt; the gold medal, or thirty guineas.

Certificates that at least one ton of the ore has been raised; and five pounds of Zaffre, and ten pounds of Smalt made therefrom, to be produced to the Society on or before the last Tuesday in March, 1812.

N. B. It appears from the minutes of the Society, in 1755, that a discovery of Cobalt was made at or near Truro in Cornwall, but not a sufficient quantity of ore found to answer the desired purpose.

89. Refining Copper from the Ore. To the person who shall discover to the Society the best method of separating, purifying, and refining copper from the ore, so as to render it fit for the finest purposes to which fine copper is now applied, and by a process superior to any hitherto known or in use, and not higher in price; the gold medal, or fifty guineas.

Certificates that not less than three tons have been so prepared or refined, and a quantity not less than one hundred weight of the copper so refined to be produced to the Society on or before the first Tuesday in February, 1812.

90. Mineralogical Map of England and Wales. To the person who shall complete and publish an accurate mineralogical map of England and Wales, on a scale of not less than ten miles to an inch, containing an account of the situation of the different mines therein, and describing the kinds of minerals thence produced; the gold medal, or fifty guineas.

Certificates of the accuracy of such map, together with the map, to be produced to the Society on or before the first Tuesday in February, 1812. The map to remain the property of the Society.

91. Mineralogical Map of Ireland. The same premium is offered for a mineralogical map of Ireland, on similar conditions.

92. Mineralogical Map of Scotland. The same premium is offered for a mineralogical map of Scotland, on similar conditions.

93. Natural History. To the author who shall publish, in the year 1811, the natural history of any county in the united kingdom; the gold medal, or fifty guineas.

It is required that the several natural productions, animal, vegetable, and mineral, peculiar to the county, or found therein, be carefully and scientifically arranged and described, in order that the public may be enabled to judge what arts or manufactures are most likely to succeed in such county. The work to be delivered to the Society on or before the last Tuesday in January, 1812, and a copy to be the property of the Society.

PREMIUMS IN POLITE ARTS.

94. Honorary Premiums for Drawings by Nobility. For the best original drawing of any kind, by young gentlemen under the age of twenty-one, sons or grandsons of peers or peeresses in their own right, of Great Britain or Ireland; the honorary medal of the Society in gold.

95. The silver medal for the best copy.

96—97. The same premiums will be given, on the like conditions, to young ladies, daughters or grand-daughters of peers or peeresses in their own right, of Great Britain or Ireland.

98. Honorary Premiums for Drawings by Gentlemen. For the best original drawing of any kind, by young gentlemen under the age of twenty-one; the gold medal.

99. For the best copy, the silver medal.

100—101. The same premiums will be given for drawings by young ladies.

N. B. As the foregoing honorary premiums are intended only for such of the nobility and gentry as may hereafter become patrons or patronesses of the arts; persons professing any branch of the polite arts, or any business dependant on the arts of design, or the sons or daughters of such persons, will not be admitted candidates in the above classes, including 94 to 101.

102. DRAWINGS OF OUTLINES. For the best outline, after the plaister cast of Antinous, by persons of either sex under the age of twenty-one, the figure not less than eighteen inches; the silver medal.

103. DRAWINGS OF LANDSCAPES. For the best drawing, in water-colours, of a landscape after nature, not less than eighteen inches by twelve, by persons of either sex, under twenty-one years of age; the silver medal.

104. HISTORICAL DRAWINGS. For the best historical drawing, being an original composition of three or more human figures, the height of the principal figure not less than eight inches, by persons of either sex under twenty-one years of age; the gold medal.

105. For the next in merit; the silver medal.

106. PREMIUMS FOR DRAWINGS IN GENERAL. For the best original drawing of any kind, by persons of either sex, under the age of twenty-one; the gold medal.

107. For the best copy, the silver medal.

108. PERSPECTIVE DRAWINGS OF MACHINES. For the best perspective drawings of machines, by persons under twenty-one years of age; the silver medal.

109. PAINTINGS IN OIL. For the best painting in oil, of a landscape after nature, the size thirty-six by twenty-eight inches; by persons of either sex, under twenty-five years of age; the gold medal.

110. For the next in merit, the silver medal. Each candidate must mention from whence the view was taken.

111. PLASTER CAST. For the best original model of a single figure, or group not exceeding three figures; the gold medallion.

112. For the next in merit; the silver medallion, on similar conditions.

N. B. Purity and simplicity are required to be attended to in the general form, as well as correctness in the several parts of the figure.

A cast from the model to remain the property of the Society.

The following inscription to be engraved on these medallions; *The Premium given by the Society for the Encouragement of Arts, Manufactures, and Commerce, in conformity to the Will of John Stock, Esq. of Hampstead.*

113. BRONZES. For the best drapery figure or group cast in bronze; if a single figure, not less than twelve inches high, and and if a group, not less than nine inches; and which will require the least additional labour to repair; the gold medal, or the silver medal and twenty guineas.

The Society, sensible of the great importance of correct Drawing and free Etching, as the best and most solid ground work for the rising school of engraving, offer the following premiums for the pupils of engravers, or others who practice that art.

114. DRAWINGS BY ENGRAVERS' PUPILS, &c. For the best finished drawing of the statue of the Discobolos, No. 34, in the British Museum; the size of the drawing not less than eighteen inches, by persons under twenty-one years of age; the silver medal.

115. DRAWINGS OF THE HAND AND FOOT. For the best drawing with a reed, or common pen, of the human hand and foot, the size of life, or larger; the several parts marked with anatomical accuracy; the lesser silver medal.

116. PEN DRAWING OF A HEAD. For the best free pen drawing of the head of Homer, marked No. 33, in the British Museum, not less than twelve inches in heighth; the lesser silver medal.

N. B. Those artists who are inclined to make trial for the premiums in drawing of the Discobolos, or the head of Homer, (with permission of the trustees) at the British Museum, in the room marked X, may be informed by the Secretary, of the proper mode of applying for that permission.

117. ETCHING OF AN HISTORICAL SUBJECT. For the best free etching in historical composition from a picture of eminence; the gold medal.

118. For the next in merit; the silver medal.

119. ETCHING OF A LANDSCAPE. For the best free etching in landscape composition, from a picture of eminence; the silver medal.

120. ETCHING OF A PORTRAIT. For the best free etching of a portrait; the silver medal.

The manner of Vandyke and Rembrandt is recommended.

121. HISTORICAL ENGRAVING. For the best finished engraving in historical composition, wherein the chiaro scuro is required to be particularly attended to; the gold medal.

122. For the next in merit; the silver medal.

123. LANDSCAPE ENGRAVING. For the best finished engraving in landscape composition, wherein the same attention to chiaro scuro will be required; the gold medal.

124. For the next in merit; the silver medal.

125. ENGRAVING OF A PORTRAIT. For the best finished engraving of a portrait, with equal attention to chiaro scuro; the gold medal.

126. For the next in merit; the silver medal.

N. B. In the class of finished engravings the Society require a forward aquafortis impression, and two in progressive states of the plate; and a finished proof to be sent, and to remain with the Society.

127. Engraving on Wood Blocks. For the best engraving on wood blocks of an historical subject; the size of the principal figure not less than six inches in height, and the block to be at least twelve inches by nine; the gold medal.

Two or more impressions, with the block, to be produced to the Society. The impressions, but not the block, to remain the property of the Society.

128. For the next in merit; the silver medal, on similar conditions.

129. Medal Die Engraving. For the best die engraving of one or more heads after the engraver's own model; the gold medal.

130. For the next in merit; the silver medal.

131. For the best die engraving of one figure, or a group consisting of not more than three figures, after the engraver's own model; the gold medal.

132. For the next in merit; the silver medal.

The dies, with two impressions or casts, and the model, in each claim for medal die sinking are to be produced to the Society. The impressions or casts, but not the model or die, to remain the property of the Society.

133. Black Lead Pencils. The silver medal, or twenty guineas, is offered to the person who shall discover an effectual method of freeing black-lead from impurity, and improving its quality, for the purposes of the arts.

N. B. The object of this premium is to obtain hard or soft pencils, uniformly of a good quality.

CONDITIONS.

FOR THE POLITE ARTS.

No articles in the class of polite arts, whether for claims or bounties, are to be admitted into the Society after the first Tuesday in March, 1812.

No person who has gained the first premium in any class shall be admitted a candidate in a class of inferior age; and no candidate shall receive more than one premium in one year.

No person shall be admitted a candidate in any class, who has already obtained the first premium in that class.

No more than one performance in any class shall be received from the same candidate.

All performances (to which premiums or bounties are adjudged) shall remain with the Society until the first Wednesday in June, 1812, when they will be re-delivered, unless mentioned in the premiums to the contrary.

No performance shall be admitted, that has obtained a premium, reward, or gratification, from any other society, or academy, or been offered for that purpose.

It is required, that the matters for which premiums are offered, be delivered in without names, or any intimation to whom they belong; that each particular thing be marked in what manner each claimant thinks fit, such claimant sending with it a paper sealed up, having on the outside a corresponding mark, and on the inside the claimant's name, residence, and age; which paper is not to be opened unless the candidate be successful, or by a special vote of the Society.

To encourage real merit; and prevent attempts to impose on the Society, by producing drawings made or retouched by any other person than the candidate, the Society require a specimen of the abilities of each successful candidate, to be made under the inspection of the Committee of Polite Arts, in every instance where such proof may appear necessary.

All candidates in the Polite Arts are required to signify, on their drawings, whether the performances are originals or copies; and to mark thereon the class for which each is intended, and if possible to send the originals from whence the copies were taken.

PREMIUMS FOR ENCOURAGING AND IMPROVING MANUFACTURES.

134. Employment of Females. To the person who shall instruct and employ the greatest number of females, not fewer than twenty, in the making of mens' cloaths, particularly of woollen cloth, and not being for the use of the army or navy; the gold medal, or fifty guineas.

Certificates that the number of women above-mentioned, have been constantly so employed for at least three months, to be produced to the Society, on or before the last Tuesday in March, 1812.

135. For the next greatest number of women so employed, not fewer than ten; the silver medal, or fifteen guineas, on similar conditions.

136. Cloth from Hop-Stalks, Nettles, &c. To the person who shall produce to the Society the greatest quantity, not less than thirty yards of cloth, at least 27 inches wide, made in Great Britain or Ireland, of hop-stalks or bines, nettles, or other raw vegetable substances, the produce of Great Britain or Ireland, superior to any hitherto manufactured from such substances, and which can be generally afforded as cheap as cloth of equal quality and appearance

now made from hemp, flax, or cotton, and much finer in quality than any hitherto manufactured in England from hop-stalks, &c.; the gold medal, or thirty guineas.

One pound of the thread of which the cloth is made, and thirty yards of the cloth, together with proper *certificates* that the whole is manufactured from hop-stalks or bines, &c. to be produced to the Society on or before the first Tuesday in December, 1811.

N. B. The Society is already in the possession of cloth made in England from hop-stalks or bines, and nettles, which may be inspected by application to the Housekeeper.

137. Sheep's Wool. To the person who shall prove to the Society that he has sold the largest quantity of Merino wool, or such wool as will answer the same purposes, being the produce of his own flock, for the purpose of being manufactured in superfine cloth, the quantity of wool not less than five hundred weight, in the year 1811; the gold medal.

Certificates, along with samples of the wool, and of cloth manufactured from it, to be produced to the Society on or before the last Tuesday in March, 1812.

138. For the next greatest quantity, not less than two hundred and fifty pounds; the silver medal on similar conditions.

139. Hog's Bristles. To the person who shall prepare the greatest quantity of bristles, from swine bred in the united kingdoms, equal in quality to those imported from Russia or Prussia, and at as cheap a rate; the silver medal, or fifteen guineas.

Certificates, that not less than one hundred weight have been so prepared, and a sample of not less than fourteen pounds of such bristles, to be produced to the Society on or before the last Tuesday in February, 1812.

140. Wicks for Candles or Lamps. To the person who shall discover to the Society a method of manufacturing hop-stalks or bines, nettles, or any other cheap material, the growth of Great Britain, so as to render them equally fit for the purpose of supplying the place of cotton, for wicks of candles or lamps; the silver medal, or twenty guineas.

Samples, not less than five pounds weight, of the wick so prepared, to be produced to the Society on or before the last Tuesday in December, 1811, with *certificates* that the whole quantity is equal in quality to the sample.

141. Experiments to ascertain the proper Thickness of Wicks for Candles. To the person who shall make known to the Society the most satisfactory result of a series of experiments, actually made by him to determine the best thickness of cotton wicks for candles, so as to obviate the defects of those commonly used; the silver medal, or ten guineas.

Certificates, that not less than one hundred weight have been so made, and six pounds of the candles, to be produced to the Society on or before the last Tuesday in February, 1812.

N. B. The intention in offering this premium, is to ascertain the proper thickness or bulk of the wick in proportion to that of the tallow, and to remove the unpleasant consequences and waste arising from the sparkling, or guttering of the candles in common use.

142. Paper from raw Vegetable Substances. To the person who shall, between the first of January, 1811, and the first of January, 1812, make the greatest quantity, and of the best quality, (not less than ten reams) of good and useful paper, from raw vegetable substances, the produce of Great Britain or Ireland, of which one hundred weight has not been used in manufacturing paper, previous to January, 1810, superior to any hitherto manufactured from such substances, and which can be generally afforded as cheap as paper of equal quality and appearance now made from rags; the silver medal, or twenty guineas.

N. B. The object of the Society being to add to the number and quantity of raw materials used in this manufacture, it is their wish to include every useful sort of paper, and to introduce such natural products as can be easily and cheaply procured in great quantities. The Society are in possession of two volumes containing a great variety of specimens of paper made from raw vegetable substances, viz. nettles, potatoe-haulm, poplar, hop-bines, &c. which volumes may be inspected by any person on application to the Housekeeper.

Certificates of the making such paper, and and one ream of the paper, to be produced on or before the second Tuesday in January, 1812.

143. Transparent Paper. To the person who shall discover to the Society a method of making paper from the pulp, that shall be perfectly transparent, and of a substance and body equal to foolscap, that shall take and bear common writing-ink, with the same facility and correctness as writing-paper generally in use; the silver medal, or twenty guineas.

Certificates of the making such paper, an *account* of the process, and one ream of the paper, to be produced on or before the second Tuesday in January, 1812.

144. Chintz Patterns for Calico-Printers. For the best original pattern in a new taste, of light and dark-ground chintz for garment-work, or furniture, fit for the purposes of calico-printers, by persons of either sex; the silver medal. The pattern for which the premium is adjudged to remain the property of the Society.

145. Copper-plate Patterns for Calico-Printers. For the best pattern, in a new style, fit for the purposes of calico-

printers for garment-work, or furniture; the silver medal. The pattern for which premium is adjudged to remain the property of the Society.

N. B. The patterns to be produced on or before the last Tuesday in February, 1812.

146. Manufacture of Sail Cloth. To the person who shall produce to the Society a whole piece of sail-cloth, of his own manufacture, proper for the general use of the Royal Navy, and equal to the best Dutch; the gold medal, or forty guineas.

Certificates of its being manufactured by the person sending it, and a particular detail of the several circumstances attending its manufacture through the different stages thereof, to be sent to the Society on or before the last Tuesday in March, 1812.

147. For the next best in merit on similar conditions, the silver medal, or twenty guineas.

148. Gloves equal to French Kid. To the person who shall make known to the Society, a process equal to that of the French, or a superior one; for preparing, dyeing, and finishing the skins, verified by actual experiments, and the communication accompanied with at least a dozen pair of gloves made from skins so prepared in an equal or superior manner; the gold medal, or forty guineas.

Certificates from competent persons fully approving of the result of such experiments, together with the gloves and communication to be produced to the Society on or before the last Tuesday in March, 1812.

PREMIUMS IN MECHANICS.

149. Gunpowder Mills. To the person who, in the year 1811, shall invent and bring to perfection the most effectual method of so conducting the works of gunpowder-mills, in the business of making gunpowder, as to prevent explosion; the gold medal, or one hundred guineas.

Certificates and *accounts* of the method having been put in practice in one or more gunpowder-mills in this kingdom, and that it promises, in the opinion of the best judges concerned in such works, to answer the purpose intended, to be produced to the Society on or before the first Tuesday in February, 1812.

N. B. As an encouragement to persons to turn their thoughts to improvements of this nature, if any should be made on the present method of conducting the business of gunpowder making, which fall short of the total prevention of explosion, and they are sent to the Society for the sake of humanity, the papers so sent in will receive due consideration, and such bounty or reward will be bestowed as they may appear to merit.

150. Transit Instrument. To the person who shall invent and produce to the Society a cheap and portable transit-instrument which may easily be converted into a zenith-sector, capable of being accurately and expeditiously adjusted for the purpose of finding the latitudes and longitudes of places, and superior to any portable transit-instrument now in use; the gold medal, or forty guineas.

To be produced on or before the last Tuesday in January, 1812.

151. Taking Whales by the Gun-Harpoon. To the person who, in the year 1811, shall strike the greatest number of whales, not fewer than three, with the gun-harpoon; ten guineas.

Certificates of the striking such whales, and that they were actually taken in the year 1811, signed by the master, or by the mate when the claim is made by the master, to be produced to the Society, on or before the last Tuesday in December, 1811.

This premium is extended one year further, on similar conditions.

152. Family Mill. To the person who shall invent and produce to the Society the best-constructed mill for grinding corn for the use of private families, or parish-poor; the construction to be such as to render the working of the mill easy and expeditious, and superior to any hitherto in use; the gold medal, or thirty guineas.

The mill, and *certificates* of its having been used to good effect, to be produced to the Society on or before the first Tuesday in February, 1812. Cheapness and simplicity will be considered as essential parts of its merit; and the mill or a model, to remain with the Society.

153. Machine for raising Coals, Ore, &c. &c. To the person who shall invent a machine for raising coals, ore, &c. from mines, superior to any hitherto known or in use; and which shall produce the effect at a less expense than those already known or in use; the gold medal, or fifty guineas.

A model of the machine, made on a scale of not less than one inch to a foot, with a *certificate* that a machine at large on the same construction has been advantageously used, to be produced to the Society on or before the second Tuesday in February, 1812.

154. Improved Walking-Wheel, or Crane. To the person who shall invent an improved walking-wheel or crane, on which the weight and power of any person or persons shall be applied with the greatest safety and effect, and so contrived that the power can be varied according to the greater or less weight to be raised or lowered; the gold medal, or thirty guineas.

The model on a scale of not less than one inch to a foot, with a proper *certificate* that the machine at large has been employed to good effect, to be produced to the Society on or before the second Tuesday in February, 1812.

155. Machine for raising Water. To the person who shall invent a machine on a better, cheaper, and more simple construction than any hitherto known or in use for raising water out of wells, &c. from a depth of not less than fifty feet; the gold medal, or thirty guineas.

Certificates of the performance of the machine, and a model of it, on a scale of not less than one inch to a foot, to be produced to the Society on or before the first Tuesday in February, 1812.

156. Elm Pipes. To the person who shall invent and discover to the Society a substitute for the elm pipes now in common use for the conveyance of water, which shall be cheaper, equally effectual, and more durable than any heretofore employed; the gold medal, or fifty guineas.

It is required that one of the pipes so employed, an accurate *account* of the method used, and every expense attending it, together with satisfactory accounts of its being effectual, to be delivered to the Society on or before the second Tuesday in January, 1812.

157. Laying Wooden Pipes. To the person who shall invent and discover to the Society a superior method of laying or connecting the wooden pipes now in use for conveying water, so as to lessen the injury they receive thereby; the silver medal, or twenty guineas.

It is required that a model, an accurate *account* of the method used, and every expense attending it, together with satisfactory *certificates* of its being effectual, be delivered to the Society on or before the second Tuesday in January, 1812.

158. Extinguishing Fires. To the person who shall produce to the Society the best and most effectual method of procuring an immediate supply of water in case of fire, or for the means best calculated to prevent or extinguish accidental fires in buildings, superior to any now in use; the gold medal, or thirty guineas.

Certificates of the method having been practised with success, with a full description thereof, to be delivered to the Society on or before the second Tuesday in January, 1812.

159. Boring and Blasting Rocks. To the person who shall discover to the Society a more simple, safe, cheap, and expeditious method than any hitherto known or in use, of boring or blasting rocks in mines, shafts, wells, &c.; the gold medal, or thirty guineas.

Certificates of the method having been practised with success, with a full description thereof, to be delivered to the Society on or before the first Tuesday in January, 1812.

160. Heating Rooms for the Purpose of Manufacturers. To the person who shall invent and discover to the Society a method of heating rooms, superior to any hitherto known or in use, and at a moderate expense, for the purpose of painters, japanners, and other manufacturers, so as to avoid the necessity of iron or copper tunnels going through the rooms to convey the smoke, whereby the danger from such tunnels may be prevented; the gold medal, or forty guineas.

A model or complete drawing and description of the method, with *certificates* that it has been successfully practised, to be delivered to the Society on or before the last Tuesday in March, 1812.

161. Improved Ventilation. To the person who shall invent and produce to the Society a mode of permanently ventilating the apartments in hospitals, workhouses, and other crowded places, superior to any now known or used; the gold medal, or fifty guineas.

A model of the apparatus, and a full *account* of the means by which the effect has been produced, with proper *certificates*, to be delivered to the Society on or before the last Tuesday in February, 1812.

162. Preventing Accidents from Horses falling with two-wheeled Carriages. To the person who shall invent and produce to the Society a method, superior to any hitherto known or in use, to prevent accidents from the falling of horses with two-wheeled carriages, especially on steep declivities; the silver medal, or fifteen guineas.

A model of the apparatus, and a full *account* of the means by which the effect has been produced, with proper *certificates* that the same has been used with success, to be delivered to the Society on or before the second Tuesday in January, 1812.

163. Improving Turnpike and other Roads. To the person who shall discover to the Society the most effectual and cheapest method, verified by actual experiments, of combining the materials ordinarily employed in making or repairing roads, so as to form them of the hardest consistency by their cementing properties, or by an artificial mixture of earth, stones, &c. altered by heat, or any other mode, so as to form an even, hard, and durable carriage-road; the gold medal, or thirty guineas.

It is required that an accurate *account* of the method used, and every expense attending it, together with satisfactory *certificates* of its being effectual, be delivered to the Society on or before the first Tuesday in March, 1812.

164. Raising the Bodies of Persons who have sunk under Water. To the person who shall invent and produce to the Society a cheap and portable drag, or other machine, superior to those now in use, for the purpose of taking up, in the best and most expeditious manner, and with the least injury, the bodies of persons who have sunk under water; the gold medal, or thirty guineas.

The drag or machine, to answer the purpose intended, to be produced to the Society on or before the first Tuesday in March, 1812.

165. For preventing prejudicial Effects to the Persons employed in Pointing Needles To the person who shall invent and produce to the Society a mode of obviating the prejudicial effects that attend the operation of pointing needles, by grinding them dry, during which the particles of grindstone, dust, and steel, being thrown into the air, and received with it into the lungs, occasion asthma, consumption, and other painful disorders; the gold medal, or thirty guineas.

A model of the apparatus, and a full *account* of the means by which the effect has been produced, together with proper *certificates* of its practicability and adoption, to be delivered to the Society on or before the second Tuesday in March, 1812.

PREMIUMS OFFERED FOR THE ADVANTAGE OF THE COMMERCE OF THE UNITED EMPIRE.

166. Taking Porpoises. To the people in any boat or vessel, who, in the year 1811, shall take the greatest number of porpoises on the coast of Great Britain or Ireland, by gun, harpoon, or any other method, not fewer than thirty, for the purpose of extracting oil from them; the gold medal, or thirty pounds.

Certificates of the number, signed by the persons to whom they have been sold or delivered for the purpose of extracting the oil, to be produced to the Society on or before the last Tuesday in January, 1812.

167. Oil from Porpoises. To the person who shall manufacture the greatest quantity of oil from porpoises taken on the coast of Great Britain or Ireland, in the year 1810, not less than twenty tons; the gold medal, or thirty pounds

Certificates of the oil having been made from porpoises actually caught on the coast of Great Britain or Ireland, and two gallons of the oil as a sample, to be produced to the Society on or before the last Tuesday in February, 1812.

168. Curing Herrings. To the person or persons who shall, before January, 1812, cure the greatest quantity of white herrings, not less than thirty barrels, equal in all respects to the best Dutch herrings, the same being caught in the British or Irish seas, and cured in a British or Irish vessel or port; the gold medal, or fifty guineas.

169. For the next greatest quantity, not less than fifteen barrels; the silver medal, or twenty guineas.

A sixteen gallon barrel of the herrings to be produced to the Society on or before the first Tuesday in February, 1812, with *certificates*, that the conditions of the premium have been fulfilled, and that the whole were cured in the same manner as the specimen, together with a full description of the process employed.

PREMIUMS OFFERED FOR THE ADVANTAGE OF THE BRITISH COLONIES.

170. Nutmegs. For the greatest quantity of merchantable nutmegs, not less than ten pounds weight, being the growth of his Majesty's dominions in the West Indies, or any of the British settlements on the coast of Africa, or the several islands adjacent thereto, and equal to those imported from the islands of the East Indies; the gold medal, or fifty guineas.

Satisfactory *certificates*, from the governor or commander in chief, of the place of growth, with an *account* of the number of trees, their age, nearly the quantity of fruit, on each tree, and the manner of culture, to be produced on or before the first Tuesday in January, 1812.

171. Kali for Barilla. To the person who shall have cultivated, in the Bahama islands, or any other part of his Majesty's dominions in the West Indies, or any of the British settlements on the coast of Africa, or the several islands adjacent thereto in the year 1810, the greatest quantity of land, not less than two acres, with Spanish kali fit for the purpose of making barilla; the gold medal, or thirty guineas.

172. For the next greatest quantity, not less than one acre; the silver medal, or fifteen guineas.

Certificates, signed by the governor or commander in chief for the time being, of the quantity of land so cultivated, and of the state of the plants at the time of signing such *certificates*, to be delivered to the Society, with samples of the kali, on or before the second Tuesday in January, 1812.

173. Destroying the Insect commonly called the Borer. To the person who shall discover to the Society an effectual method of destroying the insect commonly called the borer, which has of late years been so destructive to the sugar canes in the West-India islands, the British settlements on the coast of Africa, and the several islands adjacent thereto; the gold medal, or fifty guineas.

The discovery to be ascertained by satisfactory *certificates*, under the hand and seal of the governor or commander in chief for the time being, and of some other respectable persons, inhabitants of the islands, or other place, in which the remedy has been successfully applied; such *certificates* to be delivered to the Society on or before the first Tuesday in January, 1812.

174. Cultivation of Hemp in Upper Canada. To the person who shall sow with hemp, the greatest quantity of land in the province of Upper Canada, not less

than six arpents, (each four-fifths of a statute acre) in the year 1810, and shall at the proper season cause to be plucked the summer hemp, or male hemp bearing no seed, and continue the winter hemp, or female hemp bearing seed, on the ground until the seed is ripe; the gold medal, or one hundred dollars.

175. To the person who shall sow with hemp the next greatest quantity of land in the same province of Upper Canada, not less than five arpents in the year 1810, in the manner above mentioned; the silver medal, or eighty dollars.

176. For the next greatest quantity of land, in the same province, and in a similar manner, not less than four arpents; sixty dollars.

177. For the next greatest quantity of land in the same province, and in a similar manner, not less than three arpents; forty dollars.

178. For the next greatest quantity of land in the same province, and in a similar manner, not less than one arpent; twenty dollars.

Certificates of the number of arpents, the method of culture, of the plucking of the hemp, with a general *account* whether sown broad-cast or in drills, the expense, soil, cultivation, and produce, to be transmitted to the Society, certified under the hand and seal of the governor or lieutenant-governor, together with 28 lb. of the hemp, and two quarts of the seed, on or before the last Tuesday in April, 1812.

179 to 183. In Lower Canada. Premiums exactly similar in all respects to those held out for the province of Upper Canada, are also offered to the province of Lower Canada.

184 to 188. In Nova Scotia and New Brunswic. Similar premiums in all respects are also offered to the provinces of Nova Scotia, and New Brunswic.

189 Importation of Hemp from Canada, Nova Scotia, and New Brunswic. To the master of that vessel which shall bring to this country the greatest quantity of marketable hemp, not less than one hundred tons, in the year 1811, the produce of Upper Canada, or of one of the above-mentioned provinces; the gold medal.

190. To the master of that vessel which shall bring the next quantity, not less than fifty tons; the silver medal.

Certificates satisfactory to the Society, to be produced by the master of the vessel on or before the first Tuesday in February, 1812, to testify that such hemp was grown and prepared in Canada, Nova Scotia, or New Brunswic.

191. Substitute for Hemp. To the person who, in the year 1811, shall discover and produce to the Society, a substitute for hemp, equally cheap, durable, and applicable to all the purposes for which hemp is now used; the gold medal, or fifty guineas.

A quantity of the substitute, not less than one hundred weight, together with proper *certificates* from the governor or commander in chief, if raised in any of the British colonies, or from the Secretary of the Board of Trade, if raised in the East Indies, to prove that the same has been used with success, to be produced to the Society on or before the last Tuesday in February, 1812.

N. B. The premiums for Nos. 170, *to* 191, *are all extended one year further, on similar conditions. Certificates to be produced at the same time of the year ensuing.*

192. Silk. For the greatest quantity of silk proper for manufactures, not less than one hundred pounds weight produced by any person in Malta, or islands near adjacent thereto, in the possession of Great Britain in the year 1812, from silk-worms bred there; the gold medal, or fifty guineas.

Specimens of the silk, not less than one pound, with an *account* of the method in which the silk-worms were managed; the kind and size of the mulberry-trees from whence they were furnished with food, and particulars respecting the culture of the mulberry-trees for that purpose, to be produced to the Society on or before the first Tuesday in March, 1813.

193. For the next greatest quantity, not less than fifty pounds, on similar conditions; the silver medal, or twenty guineas.

Satisfactory *certificates* from the governor or commander in chief of the district where the said silk was produced, and of the several particulars above-mentioned, to be delivered to the Society along with the samples required.

N. B. The same premiums, on similar conditions, will be given for silk produced in the years 1813 and 1814, *certificates* to be sent at the same time of the years ensuing.

PREMIUMS OFFERED FOR THE ADVANTAGE OF THE BRITISH SETTLEMENTS IN THE EAST INDIES.

194. Bhaugulpore Cotton. To the person who shall import into the port of London, in the year 1811, the greatest quantity, not less than one ton, of the Bhangulpore cotton, from which cloths are made in imitation of nankeen, without dyeing; the gold medal.

A quantity of the cotton, not less than five pounds weight, in the pod, and five pounds carded, to be produced to the Society, with proper *certificates*, signed by the Secretary of the Board of Trade of Bengal or Bombay, on or before the last Tuesday in February, 1812.

195. Annatto. To the person who, in the year 1811, shall import into the port of London, from any part of the British settlements in the East Indies, the greatest quantity of annatto, not less than five hundred weight; the gold medal.

A quantity of the annatto, not less than ten pounds weight, to be produced to the Society, with proper *certificates*, signed by the Secretary of the Board of Trade of the respective settlement, that the annatto is the produce of such settlement, on or before the last Tuesday in February, 1812.

196. TRUE COCHINEAL. To the person who, in the year 1811, shall import into the port of London, from any part of the British settlements in the East Indies, the greatest quantity of true cochineal, not less than three hundred weight; the gold medal.

A quantity of the cochineal, not less than three pounds weight, with proper *certificates*, signed by the Secretary of the Board of Trade of the respective settlement, that the cochineal is the produce of such settlement; to be produced to the Society on or before the first Tuesday in February, 1812.

N. B. The premiums from No. 194 *to* 196 *inclusive, are all extended two years further on similar conditions. Certificates to be produced at the same time of the years ensuing.*

GENERAL CONDITIONS.

AS the great object of the Society in rewarding individuals is to draw forth and give currency to those inventions and improvements, which are likely to benefit the public at large, candidates are requested to observe, that if the *means*, by which the respective objects are effected, do require an expense or trouble too great for *general purposes*, the Society will not consider itself as bound to give the offered *reward*; but, though it thus reserves the power of giving in all cases such part only of any premium as the performance shall be adjudged to deserve, or of withholding the whole if there be no merit, yet the candidates may be assured the Society will always judge liberally of their several claims.

All candidates are to take notice, that no claim for a premium will be attended to, unless the conditions of the advertisement are fully complied with.

All models of machines, which obtain premiums or bounties, shall be the property of the Society; and, where a premium or bounty is given for any machine, a perfect model and description thereof shall be given to the Society.

All the premiums of this Society are designed for Great Britain and Ireland, unless expressly mentioned to the contrary.

The claims shall be determined as soon as possible after the delivery of the specimens.

It is expected that all articles for claims or bounties be sent to the Society, carriage paid.

No person shall receive any premium, bounty, or encouragement, from the Society, for any matter for which he has obtained, or purposes to obtain, a patent, or for which he has obtained, or expects any premium or reward from any other Society.

A candidate for a premium, or a person applying for a bounty, being detected in any disingenuous method to impose on the Society, shall forfeit such bounty, and be deemed incapable of obtaining any for the future.

No member of this Society shall be a candidate for, or entitled to receive, any premium, bounty, or reward whatsoever, except the honorary medal of the Society. The candidates are, in all cases, expected to furnish a particular account of the subject of their claims; and where certificates are required to be produced in claim of premiums, they should be expressed, as nearly as possible, in the words of the respective advertisements, and be signed by persons who have a positive knowledge of the facts stated.

Where premiums or bounties are obtained in consequence of specimens produced, the Society mean to retain such part of those specimens as they may judge necessary, making a reasonable allowance for the same.

No candidate, not a member, shall be present at any meeting of the Society or Committees, or admitted at the Society's rooms, after they have delivered in their claims, until such claims are adjudged, unless summoned by the Committee.

The Society, anxious to promote the Arts of their country, have adopted the resolution of forming a Collection of Prints, to be open for public inspection; and, having arranged those already in their possession, invite engravers to send etched or finished proofs of their plates; and hope that amateurs, collectors, and publishers of works of art, will also contribute to the undertaking.

Prints of machines, or maps, will also come within the above arrangement.

The Society further invite the communications of scientific and practical men, upon all subjects connected with the views of the Society, although their experiments may have been conducted upon a smaller scale than the terms required by the premiums; as such communications

communications may afford ground for more extensive application, and thus materially contribute to the advantage of the public.

The Library of the Society, which has already become very valuable, may yet receive considerable additions and improvements from the presents of members, or other persons who may be inclined to place useful books or valuable manuscripts in a repository, at once permanent and conducive to the national benefit.

All communications are to be made by letter, addressed to CHARLES TAYLOR, M. D. the Secretary, *at the Society of Arts, &c. Adelphi, London.*

And where articles are sent by Sea for the Society, the Bills of Lading are to be addressed to the care of WILLIAM VAUGHAN, Esq. *Mincing-lane, London,* who has politely undertaken to receive them for the Society.

The Winchester bushel is the measure referred to for grain; and, as the acres of different districts vary in extent, it is necessary to observe, that the Society mean Statute Acres of five and a half yards to the rod or pole, when acres are mentioned in their list of premiums; and they request that all communications to them may be made agreeably thereto.

The Society desire that the Papers on different subjects sent to them may be full, clear, and explicit, fit for publication, and rather in the form of Essays than of Letters: and that descriptive Drawings may be sent, with the Models and Machines laid before the Society.

*** To persons inclined to leave a sum of money to this Society by will, the following form is offered for that purpose.

Item. I give and bequeath to A. B. and C. D. the sum of upon condition and to the intent that they, or one of them, do pay the same to the Collector, for the time being, of a Society in London, who now call themselves the Society for the Encouragement of Arts, Manufactures, and Commerce; which said sum of I will and desire may be paid out of my personal estate, and applied towards the carrying on the laudable designs of the Society.

N. B. The Society considering that it would be beneficial to the Commerce of the United Kingdom to bring the British Marbles into more general use, and that the most effectual method of accomplishing their object would be, for the present, *to make them more generally known in the capital, have come to the following resolutions:—*

Resolved.—That specimens of British Marbles be exposed in the Society's Rooms, in the Adelphi, for the inspection of the public, under the following regulations:

1st. That all the specimens be exact to a given size, *viz.* eight inches high, six inches broad, one inch thick, and polished on one face.

2. That a book be kept, containing the number of each specimen, and describing the situation of the quarry, the name of the parish where situated, the distance of the quarry from a beaten road, and the distance of that road from water-carriage, with the name of the donor and proprietor. Any remarks on the qualities of the marbles, or on the lime produced from them, will be gratefully received and preserved by the Society, as materials for future inquiries.

Resolved,—That as the exertions of the Society can be generally beneficial, only inasmuch as their views are seconded by the public, the Society request, that all persons proprietors of marble quarries, will favour them with a specimen of the marble, worked to the exact size above mentioned, with the description of the quarry as above, that the same may be entered in the book to be preserved for the use of the public. By such arrangements, it is expected that the interest of the proprietors of the quarries will be promoted, and the use of British marble much extended. A variety are already exhibited in the Society's Great Room.

The Society take this opportunity of returning their thanks to the several Societies and Individuals, who have favoured them with presents for their Repository and Library.

Premiums and Rewards bestowed by the Society of Arts, Manufactures, and Commerce, Adelphi, during their Session, which commenced on the fourth Wednesday in October, 1810, *and closed on the 3d of June,* 1811.

ON Tuesday the 28th of May, 1811, his Royal Highness the DUKE of SUSSEX, distributed the Rewards then adjudged.

IN AGRICULTURE.

To Andrew Bain, M. D. Heffleton, in Dorsetshire, for plantations of forest trees, class 14; the gold medal.

To William Congreve, Esq. Aldermaston House, Berkshire, for planting 377,520 larches, class 10; the gold medal.

To Mr. Henry Cowlishaw, Mansfield, for planting

planting 75,000 larches, class 11; the silver medal.

To H. Andrews, Esq. Wakefield, for his plantations of oaks and ash trees; the gold medal.

To W. Jones, Esq. Foxdown Hill, near Wellington, Somersetshire, for temporary ricks to secure corn in sheaves in the fields from rain till quite dry; the silver medal.

IN CHEMISTRY.

To H B. Way, Esq of Bridport Harbour, for a permanent stucco or plaster, for outside or inside walls; the silver medal.

IN POLITE ARTS.

To Miss Louisa Anne Phillipps, Wandsworth Road, for an original drawing, a view of Caermarthen; the silver pallet medal.

To Miss Eliza Phillipps, Wandsworth Road, for an original old painting, a view of Caerdiff; the silver pallet medal.

To Henry Parke, Esq. 67, Dean Street, Soho, for an original oil painting of a sudden squall off the coast of Sussex; the silver Isis medal.

To Phillip Rogers, Esq. Grove Mill Bay, near Plymouth, for an original oil painting of Oakampton Castle, class 112; the gold Isis medal.

To Mr. Denis Dighton, 4, Spring Gardens, for an original oil painting of the battle of Agincourt; the silver Isis medal.

To Mr. Thomas Mann Baynes, Castle Street, Oxford Market, for an original drawing of a landscape, class 105; the silver medal.

To Miss Tattersall, Hall's Place, Charing, Maidstone, for a drawing of a group of Garden Flowers, a copy from Hewlett; the silver pallet medal.

To Miss F. Tattersall, Hall's Place, Charing, Maidstone, for a drawing of a group of wild flowers, a copy from Hewlett; the silver pallet medal.

To Mr. James Craig, 88, Charlotte Street, Fitzroy Square, for an original etching of an historical subject from a picture by Guido Reni; the silver Isis medal.

To Mr. John Scott, Rosoman Street, Spa Fields, for two original engravings of fox hunting, class 120; the gold medal.

To Mr. Thomas Wyon, Jun. 20, John Street, Blackfriars Road, for medal die engravings, representing Peace checking the fury of War, class 126; the gold Isis medal.

To Mr. George Phillipps, Wandsworth Road, for an original design of a theatre, consisting of plan, elevation and section, class 110; the gold Isis medallion, bearing the following inscription: *The premium given by the Society for the Encouragement of Arts, Manufactures, and Commerce, in conformity to the will of John Stock, Esq. of Hampstead.*

To Miss Eliza Wright, Thomas Street, Woolwich, for an original drawing of flowers; the silver medal.

To Miss Frances Fitz-Harding Ryves, of Hale Hall, in Cumberland, for a drawing of a Concert of Music, a copy from Dominichino; the silver pallet medal.

To Mr. Isaac Jopling, 23, Fitzroy Place, Fitzroy Square, for a plaster cast, a copy of the Gladiator; the silver pallet medal.

To Mr. S. Sutton, 8, New Road, opposite Fitzroy Square, for a plaster cast of Hercules rescuing Dejanira from the Centaur Nessus, modelled from a rude sketch of an Italian master; the silver medal.

To Mr. Thomas Tyley, 23, Upper Mary-le-bone, for a plaster cast of Christ healing the sick at the pool of Bethesda, an original group; the silver Isis medal.

To Mr. Josephus J. P. Kendrick, 5, Upper Mary-le-bone Street, Fitzroy Square, for a plaster cast of a Gladiator Moriens, modelled from a private study of his own from nature; the silver Isis medal.

To Miss Emma Eleonora Kendrick, 6, Upper Mary-le-bone Street, for a drawing of a warrior from Georgione; the silver pallet medal.

To Miss Dudley, 34, King Street, Soho, for a drawing of a sleeping boy, a copy from a print by Bartolozzi; the silver pallet medal.

To Mr. R. D. Cathery, 12, Mead's Row, near the Asylum, Lambeth, for his method of fixing chalk drawings, class, 129; twenty guineas.

To Mr. I. Brewster, 4, Winchester Place, Pentonville, for a pen and ink drawing of Bacchanals, a copy from an engraving by Bartolozzi, class 107; the silver medal.

To Mr. John Carver, 37, London Street, Fitzroy Square, for a chalk drawing of a female head after Raphael, a copy; the silver pallet medal.

To Master W. C. Ross, 6, Frith Street, Soho, for an original historical drawing of Samuel presented by his mother to Eli the high priest; the silver medal and twenty guineas.

MANUFACTURES.

To Mr. Edward Smith, Brentwood, Essex, for cordage and cloth made from nettles; the silver Isis medal.

To Mr. John Robertson, St. Mary's Wynd, Edinburgh, for an improvement in weaving tartan or plaid hose; the silver medal or ten guineas.

IN MECHANICS.

To Captain T. M. Bagnold, of the Royal Marines, High Row, Knightsbridge, for a gun and carriage to clear the tops of the enemy's ships from marksmen in close action, the silver medal.

To John Stephens, Esq. Reading, for a method of making bricks for closures and other useful purposes; the silver medal.

To Henry Earle, Esq. Hanover Square, for an improved bed for persons whose limbs are fractured, or who are sick and infirm; the silver medal.

To Mr. George Webster, Leeds, for his mode of conveying steam from boilers, and preserving the air clear from vapours; the silver medal.

To Mr. J. Allan, Blewitt's Buildings, Fetter Lane, for a reflecting circle, in which the screens can be readily shifted in taking altitudes; the silver medal and twenty guineas.

To Mr. John Hodgson, Charles Street, St. James's Square, for a method of correcting the variations of the mariner's compass; the silver medal.

To Mr. John Prior, Nessfield, near Skipton, in Craven, for improvements in the striking part of a clock; the silver medal and ten guineas.

To Mr. John Fuller, 14, Hatton Garden, for an improved scarificator, by which cupping is better executed; the silver medal.

To Mr. Richard Bridgen, for a method to prevent the inhaling of noxious vapours in gilding metals; twenty guineas.

To Mr. Thomas Wood, Great Berkhempstead, Herts, for an invention to prevent prejudicial effects to the persons employed in pointing needles; the silver medal.

To Mr. William Brunton, Butterley Iron Works, in Derbyshire, for an improved pump for raising the water whilst wells are sinking or making; the silver medal.

To Mr. George Prior, Jun. of Otley, in Yorkshire, for an improved remontoire escapement for pendulum clocks; twenty guineas.

IN COLONIES AND TRADE.

To Francis Fortune, Esq. 8, Lower Thames Street, for curing British white herrings, in the Dutch method, class 165; the gold medal.

To Mr. Peter Sleavin, 7, Little Brook Street, Hampstead Road, London, for curing British white herrings; fifteen guineas.

The LIST of PREMIUMS offered may be had, *gratis*, at the Society's House in the Adelphi:

By Order of the Society,

June, 1811. CHARLES TAYLOR, M. D. Secretary.

N. B. Where errors have arisen in the address of any Member of the Society, information is desired to be given to Mr. R. Elwin, the Collector, at the Society's house in the Adelphi, who receives the Subscriptions from the Members and furnishes Receipts for the same.

Lately was published, Price 10*s.* 6*d.*

THE TWENTY-EIGHTH VOLUME of the SOCIETY'S TRANSACTIONS, which may be had from the Housekeeper, at the Society's House in the Adelphi. Also complete Sets of their Transactions, or any single Volume.

Also, An ANALYTICAL INDEX of the FIRST TWENTY-FIVE VOUMES of the TRANSACTIONS of the SOCIETY, to the Termination of their Session, June 1807, price 5s.

A CATALOGUE of the BOOKS in the Society's Library may be procured as above, price One Shilling.

R. Wilks, *Printer*, 89, *Chancery-lane.*

PAPERS

IN

AGRICULTURE.

The GOLD MEDAL *was this Session adjudged to* A. BAIN, M. D. *of Curzon-Street, for his Plantations of Forest Trees made at Heffleton, in Dorsetshire. The following Communications were received from him.*

DEAR SIR,

ABOUT three years ago, I had the honour to communicate to the Society of Arts, an account of some Plantations I had made at Heffleton, in Dorsetshire, and on that occasion my success was rewarded by the Honorary Premium of the Society. As you have seen and reported the flourishing condition of those Plantations, I will proceed to state, that I have been induced by various motives, and encouraged by the Society's approbation, to make farther exertions in the same line of improvement, by covering such parts of my

estate as are not adapted *to the purposes of husbandry*, with trees that are suited to the nature of the soil. My enclosures were multiplied, and on a large extent of heath land, exceeding one hundred and twenty-five statute acres, which had been previously well-fenced from the depredations of Sheep and Cattle, and where holes at 4½ by 5 feet asunder, had been made in the manner particularly described in my last communication. I began to plant in the Autumn of 1807. Between the 25th September of that year, and the 30th of April, 1808, I planted out on that ground 258,519 trees, as specified in the following List:—

Scotch Fir,	-	249,700
Pinaster,	-	5,410
Larch,	-	2,150
Spruce,	-	1,259

The greater part of those Trees had been raised from seed in my own Nursery, where they had been also transplanted, and were finally planted out some at two, and others at three years old.

The soil of this Plantation is gravelly and poor, the situation rather elevated, and a good deal exposed to the influence of the sea winds from the south coat; yet in spite of those circumstances, the young trees are in a very healthy thriving state, as you will see attested by two Gentlemen who live in my neighbourhood, who are Planters themselves, and well qualified to judge accurately on subjects of this kind. It is my intention to fill up this and all my fir plantations with Pinaster only, as on such soils and exposures it is the best nurse for the others; it grows most rapidly, is quite regardless of the sea winds, and is also when ripe a tree

of

of considerable value. A passage in Mr. Kent's Survey of Norfolk, published in 1796, first attracted my attention to this tree, and an intimate acquaintance with it since that period had increased my opinion of its good qualities. In the latter end of the year 1798, I planted out some Pinaster seedlings of one year old on very poor ground. My Gardener measured three of those trees in the course of the present month, and their dimensions will be found by referring to the following table. Some Larch of three years old were planted out at the same time, but on land of a better quality, yet not exceeding the rate of five shillings an acre per annum. The growth of the Larch is also noted in the table.

	Circumference at the ground.		Circumference 3 feet above the ground.		Circumference 6 feet above the ground.		Height.	
	Feet.	Inch.	Feet.	Inch.	Feet.	Inch.	Feet.	Inch.
Pinaster,								
No. 1.	3	0	2	4	1	10	20	0
No. 2.	2	8	2	0	1	4	17	0
No. 3.	2	5	1	10	1	4	18	3
Larch,								
No. 1.	3	0	2	0	1	7	24	6
No. 2.	2	6	1	9	1	6	23	9
No. 3.	2	5	1	8	1	5	23	11

It is ascertained, I believe, that the wood of Larch in a favourable situation comes to perfection at forty years old, that of Pinaster at sixty, and that of Scotch Fir at eighty years growth. Having planted between five and six hundred statute acres, chiefly with these three species of fir, I will leave to others the calculation of their probable value at the different periods of their fall, and I trust the Society will agree with me in thinking, that such land as I have described,

scribed, could not have been cultivated to equal advantage in any other way.

With my warmest wishes for the prosperity of the Society,

I am, Dear Sir,

Your very faithful and obliged Servant,

A. BAIN.

Curzon-Street, Nov. 27, 1810.

To C. TAYLOR, M. D. SEC.

DEAR SIR,

WHEN the communication for the Society of Arts which I addressed to you last week was drawn out from my papers, I was confined to my bed by severe indisposition, or I should have called to your recollection that the plantation there described, was not the only one I made in the course of the Autumn 1807. On a piece of land exceeding twelve statute acres, which had once been under the plough, but which my tenant wished to give up as little calculated for the purposes of husbandry, I planted 13,100 Ash, 8,150 Hasel, 4,560 Oak, 3,675 Laburnum, 2,000 Sycamore, with a proportion of Birch, &c. You inspected the plantation with me two years ago, and at that time it had a most promising appearance. On viewing it, however, in the month of October last, those hopes were not found to be realized; for the ash, which was the principal plant, was by no means in a thriving state. I have given directions to my Gardener to cut down the ash plants within an inch of the ground, to cut drains in the lower parts of the field where they were chiefly

chiefly planted, to replace such as are dead with birch, or in better spots with chesnut and oak, and to mix Scotch fir with the deciduous trees, for the purpose of promoting shelter and warmth throughout the plantation. I may probably hereafter take an opportunity of acquainting the Society with the success of those means in improving the appearance of this plantation, to which I have now drawn your attention, because I have reason to know that the Society of Arts, with that liberality and sound judgment which characterize all their proceedings, encourage exertion as well as success; and although it is on the latter I presume to ground my claim to the honorary reward of the Society, yet the former, I am well persuaded, will not be overlooked.

I am, Dear Sir,
Your most obedient humble Servant,

A. BAIN.

Curzon-Street, Dec. 13, 1810.

To C. Taylor, M. D. Sec.

Trees planted by Richard Vincent, from the 25th of September, 1807, to the 30th of April, 1808, on a large quantity of Heath Land, being nearly two thousand trees to each acre.

The trees were mostly taken out of Dr. Bain's Nursery, and were well-rooted plants.

Scotch Fir, 249,700,	Pinaster, 5,410,
Spruce, 1,259,	Larch, 2,150.

Richard Vincent,
Gardener and Nurseryman to
Dr. Bain.

Heffleton, Oct. 5, 1810.

CERTIFICATES *by the Right Hon.* NATHANIEL BOND, *and* THOMAS BARTLETT. Esq. *respecting* DR. BAIN'S *Plantation.*

WE desire to certify, that we have examined the land stated to have been planted as above, by Dr. Bain, at Hefleton, between the 25th of September, 1807, and the 30th of April, 1808, that it is not fit for the purposes of husbandry, that it is thoroughly well-fenced from sheep and cattle, and that the trees are generally in a healthy thriving state.

NATHANIEL BOND,
THOMAS BARTLETT.

Hefleton, Oct. 5, 1810.

The GOLD MEDAL, *being the Premium offered in Class 3, for raising Oaks, was this Session adjudged to* HENRY ANDREWS, Esq. *of Wakefield, from whom the following Communications were received.*

SIR,

UNDERSTANDING that the Society of Arts, &c. give Premiums for the encouragement of Planting, I am induced to take the liberty of sending you an account of Trees planted by me, on my estate at Kirkby-cum-Osgodby, near Rasen, in the county of Lincoln, which I hope will prove satisfactory to the Society. The oaks under article No. 3, seem to have a particular claim, as I have planted twenty-two thousand

thousand of them in the space of two years. The soil is of a very deep sandy nature, and not calculated to pay the expense of tillage. The plantations are fenced by a very thick and high sod wall.

Inclosed I send you a Certificate from my Gardener, J. Smith, of the trees planted there, with the numbers, sorts, and ages; also a certificate of two respectable witnesses, who have examined the plantations very lately, the one is a Catholic priest, the other a considerable farmer. Twelve thousand of the oaks were planted in February and March, 1809, amongst other forest trees in the plantation containing 36 acres, 3 rods, 10 perches; none of them are less than four, and many of them five years old. The remaining ten thousand oaks were planted in like manner in 1810, in a plantation containing 42 acres, 1 rod, and are three and four years old; the whole of the 218,760 trees planted on my estate abovementioned, were raised about three miles from the place where they now stand.

I am, Sir,

Your most obedient humble servant,

H. ANDREWS.

Wakefield, Dec. 29, 1810.

To C. Taylor, M. D. Sec.

Certificates.

Rasen, Dec. 25, 1810.

I, James Smith, of Rasen, in the county of Lincoln, gardener and planter, do hereby certify, that I planted the under-mentioned trees for Henry Andrews, of Wakefield,

in the county of York, Esq. upon his estate at Kirkby-cum-Osgodby, near Rasen, in the county of Lincoln.

In February and March 1809.		In February and March 1810.	
Black Italian Poplars -	500	Black Italian Poplars -	1,000
Huntingdon Willows -	1,000	Huntingdon Willows -	1,000
Sycamoors -	660	Ash - -	5,000
Ash - -	6,000	Oaks - -	10,000
Oaks - -	12,000	Scotch Firs -	48,000
Scotch Firs -	45,000	Birch - -	8,000
Birch - -	8 800	Larch - -	20,000
Larch - -	10,000	Spruce - -	20,000
Spruce - -	10,000	Alders - -	10,000
Alders - -	1,800		123,000
	95,760		

That out of the 95,760 trees planted in 1809, there are 63,160 trees, which are now five years old; and 32,600 trees which are now four years old; and that out of the 123,000 trees planted in 1810, there are 75,000 trees which are now four years old, and 48,000 trees which are now three years old; that they are planted on bad sandy land, not calculated to repay the expence of tillage; that the whole of the plantations are well-fenced with sod walls, five feet high, and three feet and a half thick; and lastly, that the whole of those trees are now in a healthy and thriving state. I am, &c.

JAMES SMITH.

Rasen, Dec. 24, 1810.

WE, the undersigned, do hereby certify, that we have examined the plantations at Kirkby-cum-Osgodby, near Rasen, in the county of Lincoln, belonging to HENRY ANDREWS, of Wakefield, in the county of York, Esq. and that we found the trees and fences agreeable to the above statement.

WILLIAM HARRIS,
THOMAS LAMBERT.

Mr.

Mr. ANDREWS, who had been some time indisposed, died previous to the time that notice was sent to Wakefield of the Premium being adjudged to him, and in consequence of the following letter from his widow, the Gold Medal was delivered to her for his daughters, through the hands of THOMAS PITT, Esq. Vice-President.

SIR,

I HAD the honor of receiving your favor of the 3d instant, addressed to my late husband, Mr. ANDREWS, whom I had the misfortune to lose the 14th ult. I know few things that would have given him more pleasure than the contents of your letter: he has left two daughters, co-heiresses of the estate on which the oaks are growing; if the high honor should be conferred on them which was intended for their deceased father, it will be acknowledged with grateful thanks and due respect by them, and,

Sir,

Your most obedient humble Servant,

M ANDREWS

Wakefield, May 8, 1811.

To C. TAYLOR, M. D. SEC.

The

The GOLD MEDAL *was this Session adjudged to* WILLIAM CONGREVE, Esq. *of Aldermaston House, Berkshire, for planting* 377,520 *Larches, being the Premium offered in Class* 10. *The following Communications were received from him.*

SIR,

I WAS last year honored by the Society with a Gold Medal for having planted with acorns about seventy-three acres of land in this parish, and in the neighbouring parish of Ufton; and I have great pleasure in informing the Society, that the plantations for which I received the Medal, continue in a very flourishing state.

I now beg leave to transmit to you a Certificate of my having planted, since January 1808, 684,560 Larches, in this and the adjoining parish of Mortimer, upon one hundred and ninety acres of a poor flinty heath, which has been lately inclosed. The plants used in 1808 and 1809 were one year's seedlings, most of which came from Scotland, and were purchased in London for five shillings a thousand; but all the Larches which I planted last spring were purchased the preceding spring, and had been one year in a nursery, which is the plan I always mean to adopt in future, as I find they are much better able to contend with the heath than the seedlings. The latter also are frequently heated by their long passage from Scotland, and I once lost several thousands from this cause. On one hundred and eight acres of land in Mortimer parish, the trees were planted in rows at the distance of three feet from each other, and the plants

in

in each row at the same distance. On fifty acres in Aldermaston parish, planted in 1809, the trees were planted at six feet each way, excepting near the outsides, where they were planted only three feet asunder, and on thirty-two acres in Aldermaston, planted in 1810, they were four feet each way, which is the distance I think preferable to any other.

Small holes were made at the time of planting with a pick-axe, and the roots of the plants carefully covered and trodden down. Whenever it is ascertained that any of the plants have died, their places are immediately filled up, so that many thousands have been planted beyond the number here mentioned. I intend to plant about one hundred acres more of the same heath next Spring; and hope to extend my plantations of Larch in this neighbourhood to five or six hundred acres. In a small plantation of Larch, made in the year 1806, I measured, in October, some of the last year's shoots, and found several to exceed three feet, and one was three feet nine inches.

Should the above communication be thought worthy of notice by the Society of Arts, I shall be happy at some future time to report the progress which the plantations may make.

I have the honor to be, Sir,

Your most obedient humble Servant,

WILLIAM CONGREVE.

Aldermaston House,
Nov. 9, 1811.

To C. Taylor, M.D. Sec.

Certificate.

CERTIFICATE.

WE, the undersigned, having resided in the neighbourhood of the above-mentioned plantations for some years, and having had frequent opportunities of seeing them, do hereby certify, that the foregoing statement is perfectly correct; and we further certify, that all the plantations are well-fenced, and are now in a flourishing condition. In February and March 1808, three hundred and seventy-seven thousand five hundred and twenty Larches were planted on seventy-eight acres of land in Mortimer parish; in February and March 1809, one hundred and forty-five thousand two hundred Larches were planted on thirty acres of land in Mortimer; and seventy-four thousand eight hundred on fifty acres of land in Aldermaston parish; and in February and March 1810, eighty-seven thousand and forty were planted on thirty-two acres of land in Aldermaston parish.

G. H. DEANE, Minister of Aldermaston;
W. STEPHENS;
W. HICKMAN.

The SILVER MEDAL *was this Session voted to Mr.* HENRY COWLISHAW, *of Mansfield, for planting* 75,000 *Larches, being the Premium offered in Class* 11. *The following Communications were received from him.*

SIR,

BETWEEN the 30th of March and the 20th of April, 1808, I planted a piece of land with Larch trees; it is situated upon

upon Blidworth Forest, (part of Sherwood Forest), and is by admeasurement, including the fences, fourteen acres three rods.

The land being chiefly covered with heath from six to eighteen inches high, I caused a piece of the heath-sod to be pared-off with a paring-spade, of a sufficient space to plant the tree in, and the soil being very thin and near the gravel, I preferred planting the tree without turning over the soil.

The season being far advanced, and having not been sooner in possession of the land, I ordered that the roots of the trees should be made wet with water, and then rubbed over with soil, which thus adhered to the roots, and in this state they were planted in the proportion of rather more than five thousand trees upon each acre, having planted seventy-five thousand trees upon the land, which is not more than fourteen acres, allowing for the fences.

The Larch trees were two years transplanted, and from eight to fifteen inches high when planted out.

The season proved very favorable, few of the trees died, as one thousand filled up the deficiencies in the autumn of 1808, and the remainder grew well. In the autumn of 1809 they were again filled up with the same number, and I have this month supplied all the deficiencies with two thousand more, as some had been destroyed by rabbits.

The plantation is now in a healthy growing state; the last season it hath much improved.

I think the above mode preferable either to destroying the heath, (as I presume it preserves the moisture in the soil during the summer, and affords warmth in the winter), or making holes by turning up the soil, and bringing what is bad upon the surface.

I am justified in these remarks from plantations adjoining mine, where both modes have been tried, and neither have answered

answered so well as my method. My plantation is protected by a quick fence, which was planted in 1808, and secured by good posts and rails all round; the quicks have grown very well, considering the nature of the soil, which is but barren, and they are likely to become a good fence.

I have sent you an account of the expences which have attended this plantation, and have inclosed Certificates from two of the most respectable inhabitants of the town of Blidworth, and remain, with great respect,

Sir,

Your humble and obedient Servant,

HENRY COWLISHAW.

Mansfield, Dec. 20, 1816.

To C. Taylor, M. D. Sec.

An Account of the Expences.

	£.	s.	d.
Purchase of the land and stamp -	200	16	0
Seventy-nine thousand Larches at 1*l.* per thousand - - -	79	0	0
Posts and rails - - -	30	9	0
Paring, planting, and putting-down the fences	38	0	0
Carriage of trees, &c. - -	2	16	0
Cleaning the trees first and second year, where the heath in any measure incommoded them	2	11	0
Expences of filling-up the deficiencies -	3	0	6
	356	12	6

Certificates

CERTIFICATES were received from Mr. THOMAS HANESWORTH, and Mr. JOHN HEATH, stating that they had reviewed the above-mentioned plantations, and believe the statement to be correct, and that the trees are effectually fenced and secured to grow timber, and are in a flourishing condition.

The SILVER MEDAL *was this Session voted to* JOHN STEPHENS, Esq. *of Reading, in Berkshire, for his method of making Bricks, so as to form cheaper and firmer Buildings, and useful under-ground Drains. The following Communications were received from him, an Explanatory Engraving is annexed, and Specimens of the Bricks are preserved in the Society's Repository.*

SIR,

I HAVE sent, for the inspection of Society of Arts, &c. three closure bricks, which on examination you will find to have been cut three fourths of the way through in the middle by a wire, and the whole of the way through at each end, which leaves the ends square and handsome for work.

The bricklayer to divide each brick in length has only to take the brick in his left hand with the mark, or cut downwards longitudinally, and by one smart blow with the trowel he will have two complete king-closures, with which he can easily make four common closures.

I have shown them to many workmen, who all approve of them. I had two hundred and fifty of them made by a brickmaker for an experiment, and I have ordered two thousand

thousand more. The builders who do the principal part of my work have had some on their own account, and have since increased their orders. I have no doubt when they are better known they will come into general use.

A considerable saving in labour and waste of bricks may be effected by their use, particularly in walls where piers are built, and where there are many openings, the work will also be rendered more substantial.

There will be a saving in room and materials where the back of a chimney is built against a straight wall, particularly in flues for low buildings.

They will be found useful in cities or large towns by being placed in partition walls instead of lath and plaster, and be a check to the ravages of fire.

They will be useful in preventing the passage of rats and mice, and the disagreeable smell occasioned when they die betwixt lath and plaster or wainscoat.

They will also answer for draining land, and will form cheaper small drains from houses than any other method.

They may be cut in other forms or directions for particular purposes according to the uses for which they are intended.

The additional expense of dividing them by the wire is about two shillings per thousand, it is generally done after they have been molded one or two days according to the dryness of the season.

I flatter myself that if this communication meets with the approbation of the Society, it will render a benefit to the public.

I am, Sir, with much esteem,

Your most obedient servant,

JOHN STEPHENS.

Reading, October 31, 1810.

To C. TAYLOR, M. D. SEC.

DEAR

DEAR SIR,

On inquiry from builders, I am informed, that the saving by the use of the bricks I have invented, will be from two and-a-half to nearly five per cent. in a five-window house in brick work and labour, in a front of forty feet with or without piers.

In ornamental brick piers for gateways, I think the saving of bricks by means of cutting may be very considerable, and in the labour still more, besides the work being done more sound and substantial.

I am using a few of them in an eleven-inch brick-wall, (a system hitherto entirely new,) in a westernly aspect, as a preventative or guard against the effects of weather, and it will, in point of dryness, be equal to a fourteen-inch wall. I have inclosed a letter from Benjamin Garroway, a bricklayer, who has requested me to let him have all the bricks I have of this kind, and to bespeak more for him. I have also sent a Certificate from Mr. Robert Wright, who is extensively engaged in buildings.

The drains for agricultural purposes might be done by women or children, except the digging of the drains, especially two-inch drains. With respect to longer drains, if they are required of four inches, and to be covered with brick, I would recommend the bricks to be laid anglewise, in order to promote strength in covering.

It would be of great importance if Parliament would allow a drawback of the duty on all bricks employed in draining.

Every brick intended for the operation I recommend, is taken off the stack two or three days after it is molded. It is then put on a stool or board, and a wire, about the size

of No. 23, is pressed on the upper side of the brick, so as to pass through each end of it, it is then immediately placed on the stack again, and afterwards burned.

I am, Dear Sir,

Your most obedient humble servant,

JOHN STEPHENS.

Reading, December 8, 1810.

To C. TAYLOR, M. D. SEC.

Letter from Mr. Richard Billing, to Mr. Stephens.

SIR,

AGREEABLY to your request, I have taken into consideration the utility of your closure bricks, and beg leave to say that my opinion coincides with yours, as to their advantage in new chimnies which are intended to be built against old walls. In constructing a new chimney it is generally considered absolutely necessary, that the same should be worked up close to the old wall, but completely unconnected, in order that it might settle from the old; in this case it is very desirable to make the back of the chimney as thin as possible, that it may project as little as convenient, and in building piers, particularly small ones, either for gate-ways or fronts of houses, where there are many bricks, and in the present mode which is so frequently adopted, of two-inch recesses at the exterior of the windows, your closures would be much preferable even in appearance to a brick which has been cut with a trowel, with the surface of course defaced.

Closure

Closure bricks might be adopted as a cheap and useful drain by a common brick flat, with two closures laid on the same two inches asunder, or four inches and reversed.

Your closures would be useful in all kind of ornamental brick work.

Two inches is a very desirable brick, but most times avoided in consequence of the waste in cutting common bricks, and difficulty in producing a smooth face, which would be completely obviated by the introduction of closure bricks.

I remain, Sir,

Your obedient humble servant,

RICHARD BILLING.

Reading, December 3, 1810.

To JOHN STEPHENS, Esq.

Letter from Mr. Benjamin Garroway, to Mr. Stephens.

SIR,

I AM of opinion that if closures were made for general use, two and-a half per cent. would be saved in brickwork of small piers, flues of chimneys, or where there are any bricks in ornamental works. Common bricks frequently will not cut more than one closure, and if your bricks were to be always had, they would be much more useful.

I remain, Sir,

Your humble servant,

BENJAMIN GARROWAY.

Ruscombe, December 5, 1810.

To JOHN STEPHENS, Esq.

Letter from Mr. Robert Wright, to Mr. Stephens.

SIR,

HAVING examined your method of cutting bricks, I am of opinion that they would be particularly useful in all kinds of brickwork, make a considerable saving in labour and materials, and that a much superior bond would be obtained by your improvement.

You are perfectly at liberty to make any use you please of my opinion.

I am, Sir,

Your very obedient servant,

ROBERT WRIGHT.

No. 5, New North-street, Red Lion-square.
London, December 6, 1810.

TO JOHN STEPHENS, ESQ.

Description of the Drawings of Mr. Stephens method of cutting bricks for various purposes. See Plate I, Fig. 2.

Fig. 2. of plate 1, is a plan of the upper surface of a common brick, the line *a a* is a cleft cut nearly through the brick while it is soft by means of a piece of wire, as is shewn in the section, fig. 3, where the section of brick is shown at BB, placed on the wooden block A, a piece of wire *b b* with a loop

a loop at each end is pressed down into it, so as to divide it into two parts, except the part C, which the wire will not cut through because of the curvature it acquires in being pressed into the brick. A brick of this kind being burnt, may be broken in two halves by one cleft with the trowel, which will be found very useful in many cases which constantly occur in brickwork, and will be far superior to the present mode of hacking the bricks, both for the soundness and appearance of the work, and will be done in less time.

Figs. 4 and 5, shew the application of these divided bricks to draining, where A B are the ends of the two halves of a brick, and C D tiles, forming the top and bottom of the drain, this method forms a square drain.

Fig. 5, shews how a triangular drain may be made with half the number of bricks of the foregoing, that is one-half brick A, and two tiles C D.

Fig. 6, is a plan of a brick divided diagonally, and fig. 7 shews how these halves may be disposed to form a triangular drain; the letters shew the same parts in each of these two figures, the bottom D may be made of tile, or of a brick cut in half in its thickness; the scale annexed to the figures will shew the dimensions of the different drains.

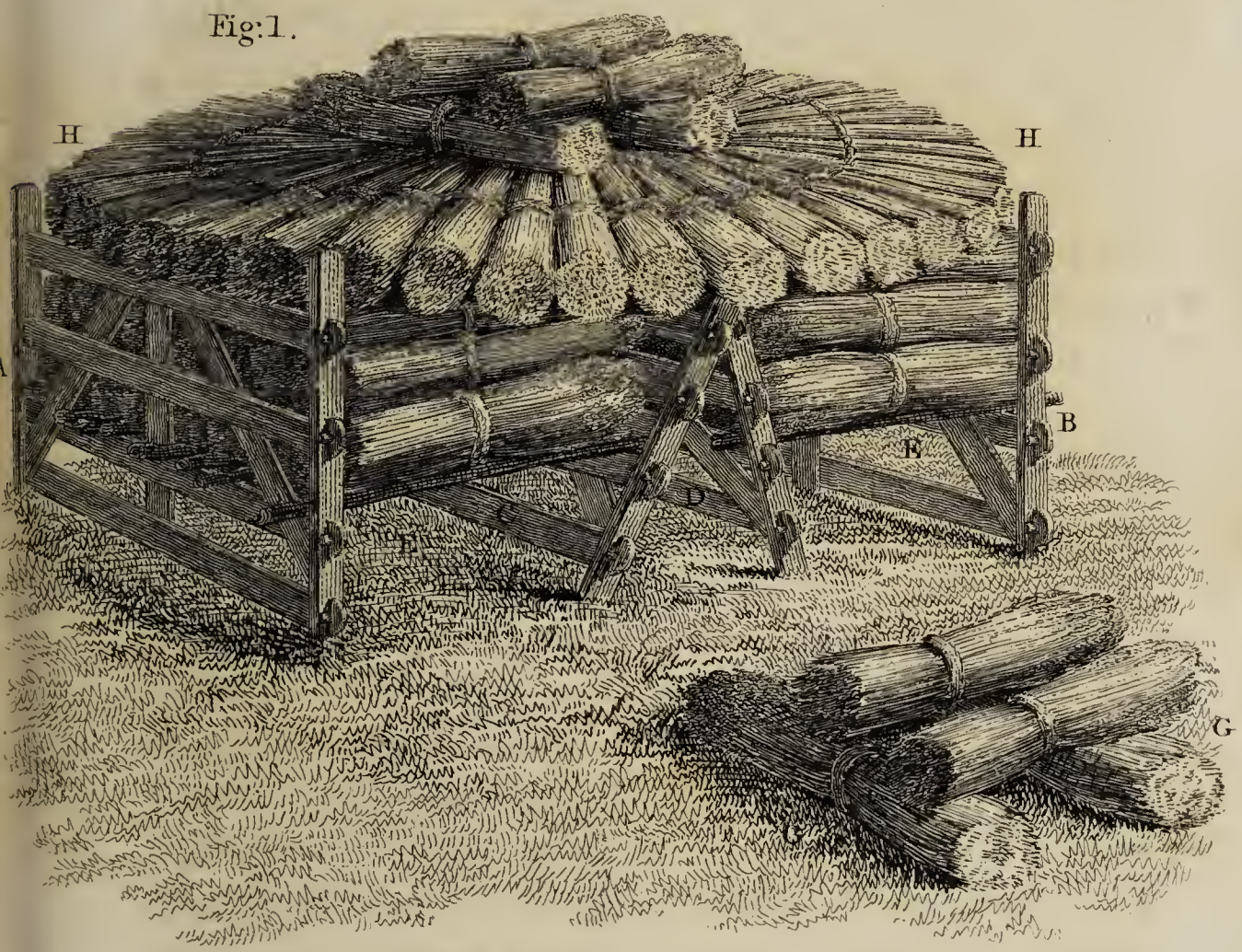
The SILVER MEDAL *was this Session voted to* WILLIAM JONES, *Esq. of Foxdown-Hill, near Wellington, Somersetshire, for the Invention of a Temporary Rick to secure Corn in Sheaves in the Fields till quite dry, also Clover, Peas, and Beans. The following Communications were received from him, two Explanatory Engravings are annexed, and a Model of the Rick is preserved in the Society's Repository.*

SIR,

THE very unusual quantity of rain that fell during the months of August and September last, with scarcely two days of dry weather following, in this neighbourhood, put farmers to the necessity of having recourse to various modes of preserving their corn, and, as I understand the Society of Arts has offered a Gold Medal for the cheapest and best mode of harvesting corn, and also for making hay in wet weather, superior to any hitherto practised, I beg leave to communicate some experiments I made last summer, and the result of them. In the first place, I put some wheat in small round ricks, or wind-rows, made in the common way of this county, but afterwards recollected that the uncommon wetness of the ground might render the under part damp, I thought it prudent to examine them, (about ten days after they were set up), and found my apprehensions so well founded, that I had the whole spread abroad; and have no doubt that, if they had remained a little longer, the corn would been materially injured, not the bottom only, for it had contracted dampness a great way up the ricks, insomuch that

Foundation of Mr. Wm. Jones's Temporary Corn Rick.

Fig: 1.



Mr. Stephen's Method of dividing Bricks.

Fig: 2.

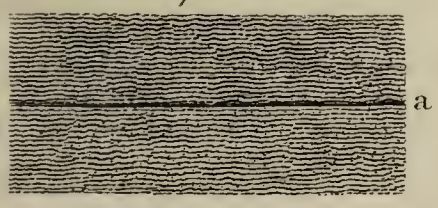


Fig: 4.

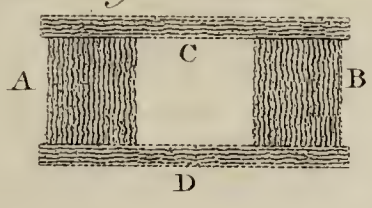


Fig: 3.

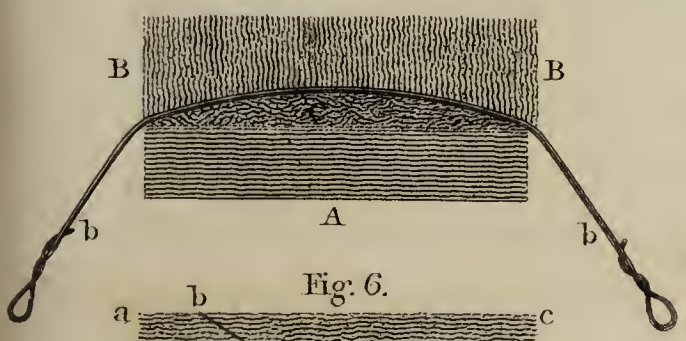


Fig: 5.

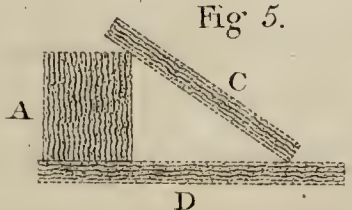
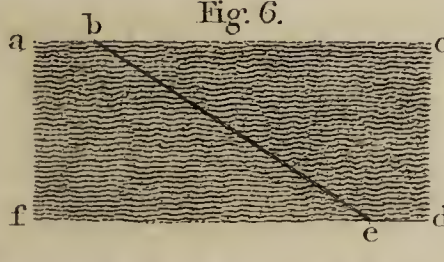
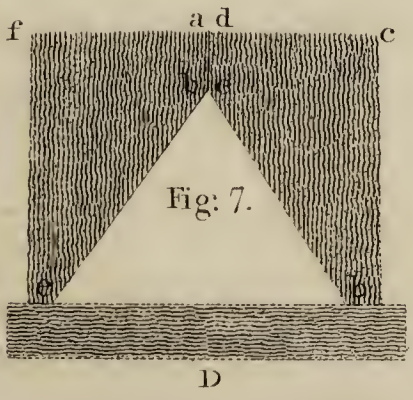


Fig: 6.





Drawn by J. Farey.

Engraved by S. Porter.

that I turned my attention to devise some better mode of preserving my barley in case the weather continued so rainy, as it afterwards proved. I had observed in some wet seasons before this, that many of our farmers, not being able to get their barley dry enough to put into a large rick, had set up narrow ricks, containing the produce of an acre or two, each in different parts of the same field it was grown, for the sake of expedition; and though some straw was put under them, yet the bottom contracted a great degree of dampness, so as to occasion it to smell old, and the clover was killed where these ricks had stood. My object was to prevent both these injuries; and it occurred to me, that four gate-hurdles would answer both purposes, by setting the two outside ones perpendicular, and two middle ones inclining against and supporting each other. These hurdles are usually eight feet long; the two heads in which the four bars are mortised have pointed ends of about a foot and a half long; the two outside ones are to be forced into the ground nearly to their full length, so that the middle brace may rest on the ground to afford some support, and the two middle was about six inches to keep them steady. The foot of the second hurdle should be set two feet from the foot of the first, the third three feet from the second, and the fourth two feet from the third, making seven feet, and occupying a space of seven feet by eight, for barley or oats, but wheat being longer in the straw, requires the distance to be wider, viz. three feet from the first to the second, three feet from the second to the third, and three feet from the third to the fourth, which will be nine feet by eight.

It will be proper to put seven or eight small stakes, (a little bigger than a man's thumb,) from the second bar of the first hurdle to the second bar of the second hurdle, and from the second bar of the third to the second bar of the fourth, to

support the sheaves from the ground, to admit air under and prevent injury to the growing clover; or small poles may be used extending from one outside hurdle to the other. The appearance of the ends of the hurdles will be as in the engraved plans, plate 1, fig. 1, and section plate 2, fig. 1, which shew where the small stakes are to be placed to prevent the sheaves touching the ground, for there will be but a slight pressure on them, since the ground end of the sheaves are to be put against the hurdle A B, and the ears of the corn a little elevated to rest against the hurdles C D, and the ears a little elevated against the centre hurdles C D; so that the ears of the corn will be all within side, and have the benefit of the air between C and D. It is to be observed that the hurdles C D being but six inches in the ground, and the hurdles A B nearly eighteen inches, that the two former will be a little higher than the two latter, which is necessary for two reasons, one is, that the higher these are, the higher the air is admitted to the middle of the rick, and the more they elevate the tops of the sheaves in the middle, for the ground ends should be lowest to shoot off the rain. But as it will be found that after two or three rows are placed around the tops of the hurdles, (for the ricks should be circular,) that the ground ends of the sheaves being largest) the tops will become nearly level, when it will be necessary to put four sheaves as at G G in the middle horizontally, forming a square, opening in the centre, which will admit air from the top of the middle hurdles C D, through this space to the middle of the rick, as the ears of each sheaf are just to meet only in the middle resting on these four sheaves *, which

* If the corn should be very damp, and the rick made high, four other sheaves may be put higher up to convey a greater circulation of air, and operate as a bond to connect the sheaves in the middle, so that they cannot possibly slide outwards.

will

will give such an elevation to the tops of them, that the ground ends will be sufficiently inclining downwards to shoot off any rain that may fall. In forming the roof, the sheaves are of course to be put farther in every time they are put around, till the roof terminates in a point, when two sheaves with the tops downwards spread abroad and bound with a straw-band, will secure it from a great deal of rain; but if the corn is to remain out long, a little reed or thatch may soon be put on each rick.

Fearing I might not have been sufficiently explicit in describing this plan, it has occurred to me that it would be better to send a model, containing 100 sheaves, made to a scale of an inch to a foot, as to the length of the hurdles, the distance from each other, and the size of the sheaves, also to exemplify every particular of it.

The weather being so rainy for some days after my barley was cut, with every appearance of more rain, I determined, on having a few hours intermission of rain, to get the middle of the field, which was a little more dry than the rest, and to put it in small ricks, containing more than the produce of an acre, on these hurdles in the same field; it was in such a damp state as to be totally spoiled in a common rick, but was taken from these ricks into a barn in the month of January last, perfectly dry, the straw much better than could have been expected, the grain good, having been proved to grow well, for having some doubt on account of being put together so damp, I had it first tried by putting a few grains in a cloth into the earth, and have since sown it, and no other this spring, and I never had a better prospect of a good crop. The remaining part of the barley that was left on the ground, was not taken in till ten days afterwards, the grain much grown, a great deal wasted by frequently turning, and the straw spoiled.

I flatter

I flatter myself it will be admitted that in wet seasons, or when harvest is so late that, as the days decrease the dews increase, and of course remain so long that there are but few hours in a day for drying, even if there should be no rain, that this method will afford perfect security to corn that is cut dry, and put up in this manner immediately from the scythe or sickle, because if there should be grass in it, the ground end of every sheaf will be without side, exposed to the sun and air to dry; and as for the grain, no part of it can get damp, because the ears but just meet in the middle, through which the air passes from the bottom to the top sufficiently to dry it. I have mentioned sheaves, because in this county barley and oats are generally bound as well as wheat, but both the former may be placed in these ricks without binding, as I had some barley put in one of them (by way of experiment,) and think it to be the better mode when there is much grass in it, by carefully keeping the ears together when carried to the hurdles, where a man is ready to put it up to another on the top, and to place the ears inwards; and it is done in as short a time as the like quantity is put on a waggon, with this advantage, that whereas a waggon with three or four horses go over the clover to the great injury of it in wet weather, by this method the corn is carried by women or children in their arms to the hurdles, without the least injury to the clover, a consideration fully adequate to a little extra expence, if any, besides that of being more expeditiously secured; for every practical farmer will be sensible in how short a time an acre of corn may be carried from the circumference of an acre to its centre. As to the time of fixing these hurdles, I have ascertained that two people can fix them in five minutes, and one rick would contain the produce of two acres of barley or oats. The other advantages, besides the corn being thus sooner secured, are, that

no

no more attendance on it is required, so that a farmer's attention may be better directed to his other harvest concerns, and that one or two of these ricks at a time, (as may be convenient,) may be taken into a barn to thrash, whereas a part of a large rick cannot be taken in without the trouble and expence of thatching the remainder, and be subject to the risk of rain before it may be covered again.

I trust it will be seen that by this plan there must be a great saving of the quantity as well as preservation of the quality of grain, which is known often times to shed a great deal by being frequently turned to get dry. Before I thought on this expedient (last barley harvest,) I am clear that a field of pease of mine required to be turned so often, that more shed out than were sown; and a farmer in this neighbourhood had a good crop of eight acres of vetches reduced to sixty bushels, by so frequently turning them for three weeks, without getting them dry at last; whereas an acre or two might have been taken up in this way a few days after they were cut, and the seed would have got sufficiently hard, but the greater part of these were so soft as to be much bruised in thrashing, and it was to be feared a great part of them would not vegetate. I had an opportunity of knowing the quantity, having the tithe of them, and proving the injury by the loss of my crop in sowing them, in so much that the land has been since ploughed.

Although I have not tried it, yet I think it is not to be doubted, but that this mode may be applied with equal advantage to clover hay, and clover seed, before it may be dry enough to put into a large rick, by being placed in this situation to dry without being so frequently turned as to deprive the hay of its finest parts, and subject the seed to great waste. In cases also when meadow hay may be dry enough to put in large cocks on the appearance of rain, how much

injury

injury do they receive by the bottom being rendered so wet as to occasion a dampness some way up, and require much time to throw abroad to dry? Whereas, in the same state of dryness, how many of such cocks may be put on four hurdles? and the bottom instead of being wet and injured will be perfectly dry, having air circulating under it, and from the two middle hurdles quite to the top; if a sheaf of reed was to be drawn-up through it, as the hay got higher, a bundle of straw on top would secure it from rain, or instead of a reed-sheaf drawn-up, a couple of small faggots of wood, or three or four poles bound together and placed horizontally about the middle of the rick, to admit air at each end, and render it dry enough to be carried on to a rick without farther trouble or risk.

Hay is known to receive injury, not only from rain, but even from fervent sunshine, when nearly dry, if not frequently turned, as may be observed by the change of colour and loss of smell, which many farmers in this neighbourhood experienced in the summer of 1809, for want of hands to turn it sufficiently. I have seen a decoction of such hay made in a tea-pot, and compared with a decoction of the like quantity of good hay in another, the former was very deficient both in colour and taste to the latter, and the quality of it, of course, much deteriorated.

We know that straw, particularly of barley or oats, will be much injured by being long on the ground exposed to soaking dews, and perhaps alternate rain and sunshine, and may it not when protected from them by this mode, be far superior for cattle to what we are at present aware of? Besides the advantages of grain, hay, and straw, being thus better preserved, and less expence of labour than by repeatedly turning in rainy seasons, there is another advantage of no small consequence, that the crops may be removed, and

put

put on hurdles in another field, (without any hindrance to sheep feeding therein) when the land from whence they were taken may be immediately ploughed; for instance, after pease, to facilitate a better fallow, (than if delayed,) to be succeeded by wheat, and ploughing clover lays for wheat, and also preparing land for turnips after vetches, to accelerate the sowing; in which case, the delay of a few days has frequently occasioned a total loss of the crop.

It is an essential consideration, that the expence attending improvements, should not counterbalance their utility: and I flatter myself, there can be no objection to this mode on that score, because gate hurdles are useful appendages to a farm, in any county for other purposes, when not used on this occasion, and in this and other counties are requisite for dividing turnips for sheep; and, as to expedition, which is of great importance in harvest concerns, four of these hurdles (as I have already observed) may be fixed in five minutes.

If, therefore, the Society for the Encouragement of Arts, Manufactures and Commerce, instituted for the laudable purposes which it professes, should think my plan combines utility with cheapness and expedition, I should consider myself flattered by their approbation, and feel a degree of satisfaction in the reflection, that I have not turned my thoughts in vain to a subject which must be allowed to be of great importance.

I am, Sir,

Your most obedient servant,

W. JONES.

Foxdown Hill, June 7th, 1810.

To C. Taylor, M. D. Sec.

SIR,

SIR,

I HAVE been favoured with your letter, acknowledging your having received my model of a temporary Rick, and recommending me to send certificates of its use.

I have to add, that the barley I had put on these hurdles last year, was done in my presence, by the same man who removed it afterwards to the barn, thrashed and sowed it; he is ready to attest my former statement, of the hurdles requiring only five minutes time to fix in the ground, of the barley preserved by them growing perfectly well, with a prospect from its present appearance, of yielding a good crop; and with this further remark, that it was so damp when put upon the hurdles, that he was apprehensive it would be spoiled, and was much surprized when he took it into the barn, to find it so perfectly dry.

I notice your query, whether these hurdles could not be applied to the purpose of temporary hovels for sheep, in wet weather? I think that if two of them were fixed eight feet apart, and two others placed on the top of them, covered with straw, reed, rushes, heath or furze, they would form a covered hovel of eight feet square, and afford great protection to sheep in wet weather, (particularly just after being shorn) and ewes in the lambing season also, if some that were the most forward with lamb, were selected and put into inclosures, where one end of each hurdle might be put against a hedge, or against a wall, or end of a hovel. These hurdles, covered in like manner also, would be useful, if a number of them, proportioned to the quantity of sheep, were put in the form of a square, in any part of a field, in hot weather, to afford shade. They would induce the sheep to lie there, and answer the purpose of folding,

as

as they could easily be moved to such part of the field as wanted improvement, and be more at ease than when creeping under hedges, to the no small detriment of their wool.

I have to report to the Society, that I have this harvest made use of the hurdles on a larger scale, viz. to keep raking wheat separate from the sheaf, and which was too damp to put in sheaf; and also in small ricks of wheat for seed, to save the trouble of taking it from a larger rick, before the whole was wanted to be thrashed; and for my tithe wheat, that was not sufficiently dry to put into a barn.

I had also five acres of white pease, which were drilled where a crop of vetches had failed, so late as the 12th of May; they proved to be a very great crop, but they ripened so late, and the tops of the haulm were so green, from having shot out to an extraordinary length, that they were not all carried till the 27th of last month. At one time I almost despaired of ever getting them dry, owing to the heavy dews which fell during the night, and continued during most of the day, so as to afford but a few hours to dry my crop. I therefore took up six waggon loads from the middle of the field, on the 25th of last month, and put them on twelve gate hurdles adjoining each other, for the purpose of making one roof, and set the hurdles in the manner of my ricks. The first two loads were put on four of these hurdles at one end, which would contain four loads if necessary; the next two on the adjoining four hurdles; and the other two loads on the four remaining hurdles; so that though these three ricks were close to each other, yet being set up separately, they admitted air between each, from the bottom to the top, and yet adjoined sufficiently to make one continued roof to be thatched together.

When these six loads were removed from the field, I had room

room to turn the remaining parcels towards each other, and more towards the middle of the field, so as to have more air to dry. But they were not sufficiently dry till the 27th, when they were carried to another set of sixteen hurdles ready to take them, and each waggon load laid over the whole length of 16 hurdles, not being so damp as to require being carried up in separate ricks, as the former six loads. Some of these pease have been already thrashed, and prove to be in very good condition, as also the haulm, which is perfectly dry and sweet for cattle.

One of these ricks of pease, and probably some of the ricks of wheat, will not be taken in till the month of February next: they may therefore be inspected by any member of the Society, who may visit this neighbourhood.

I have inclosed a certificate from Mr. Waldron, a gentleman of this parish, who farms his own estate; and another certificate from Mr. Hewitt, also of this parish, who is esteemed a respectable and intelligent farmer: he rents a farm from Mr. Ware, brother to Mr. Ware of the house of Ware, Bruce and Co. London.

I am, Sir,

Your most obedient servant,

W. JONES.

Foxdown Hill, Oct. 30th, 1810.

To C. Taylor, M. D. Sec.

Certificates.

This is to certify, that I have seen some barley on Mr. Jones's farm at Culway, in the parish of Wellington, set upon gate hurdles in the harvest of 1809, which appeared to

to me to be a very good method to secure grain in wet seasons, or when the dews remain so long on the ground, that it cannot be got sufficiently dry to put together on other ricks. I have also seen a field of barley at Mr. Jones's this year, adjoining to my farm, sown with some of the barley put on those hurdles, which grows well, and is likely to prove a good crop; and I think this invention of public utility.

HENRY WALDRON.

THIS is to certify, that I have seen since this harvest, on Mr. Jones's farm at Foxdown Hill, in the parish of Wellington, three ricks of wheat, and two ricks of pease, set upon gate hurdles, which appears to me a very good method to secure grain in wet seasons, or when the dews remain long on the ground; that I have attentively examined those ricks, and consider it to be a public benefit that a farmer may have recourse to so cheap and expeditious a method of securing his corn in difficult seasons; whereby he is able to put it together sooner, and of course expose it less to the weather.

JAMES HEWETT.

Wellington, Oct. 30th, 1810.

SIR,

AGREEABLY to your request, I lose no time to give you the information you desire, respecting the temporary corn rick, and the size they may be made. The space between

the two outside hurdles, contains about sixty sheaves on each side, or one hundred and twenty in the whole, to reach the top of the hurdles.

Every round of sheaves afterwards takes forty sheaves or upwards, say fifteen rounds high, which makes six hundred sheaves, and which will raise the rick about eight feet from the tops of the hurdles.

It will require about seventy sheaves from the top of the above fifteen rounds, to the top of the conic roof.

Four sheaves crossing each other, five times in the centre of the rick, will form in the whole twenty, making as follows:

120	Sheaves to the top of the hurdles.
600	Sheaves from the tops of the hurdles, to the commencement of the roof.
72	Sheaves in the conical roofs.
20	Sheaves in the cross or bonds of the rick.
812	Sheaves, or upwards of 81 shocks in each rick, which is more than the average produce of an acre.

The wheat in this part of the country is reaped near to the ground, and my sheaves this year, are about $4\frac{1}{2}$ feet long, for which the distance of 3 feet $2\frac{1}{2}$ inches between the outer hurdles, and 3 feet between the inner hurdles, is calculated. The distance should be regulated by the length of the sheaves of barley and oats. When shorter than four feet, the rick should be oblong instead of round.

Faggots of wood, placed at intervals within the rick, will be found particularly useful, where pease, vetches, clover, hay seeds

seeds and meadow hay, are put into these ricks, as the faggots will promote a greater circulation of air.

The number of the cross sheaves, should be according to the dampness or dryness of the corn, either in every row, or every second or third row.

Reference to Plate 2, Fig. 1, the Section of Mr. Jones's Temporary Corn Rick.

THE letters describing the same parts of the construction of the rick, agree with those in plate 1.

A B, being the two upright outside hurdles.

C D, the two inclined hurdles.

E E, the poles or sticks on which the sheaves are to be first placed on commencing the rick, and which cross the hurdles.

H H H H, the sheaves composing the body of the stack.

I I, the conical roof, the lower part of which projects sufficiently over the body of the rick, to cover it from wet, and in this roof, each round of sheaves are to be placed, so as to cover the ears of the sheaves below, and gradually rise to nearly a point, over which a bundle, containing two or three sheaves, with the butt ends upwards, and tied together, cover the centre or uppermost point of the rick.

The Society are indebted to Mr. CHARLES WAISTELL, *of High Holborn, for the following valuable Communication and Improvement, on an Acorn Dibble in the Society's Possession. An Explanatory Engraving is annexed, the original Dibble is in the Society's Repository, and* Mr. WAISTELL'S *Drawing is preserved in their Library.*

SIR,

IN consequence of information that Government wanted intelligence respecting the best mode of dibbling acorns, I have made an improvement on the acorn dibble in the Society's Repository, which I presume will answer well the desired purpose. I therefore send herewith a drawing of it, requesting you will have the goodness to lay it before the Society of Arts, &c.

Thorn bushes and thickets are the natural guardians of young oaks from the depredations of cattle of all kinds, on forests and other grounds on which they pasture. By means of this implement, acorns may be deposited in the interior of bushes, as well as in open grounds, with rapidity and accuracy. And presuming that such an implement would be of great utility to many individuals, and also to Government, I wish much to have it made known as generally as possible among those who are most likely to profit by it; and which I think may be best effected by the Society of Arts, &c. giving an engraving of it in their next volume; provided they concur with me in thinking it may be the means of rearing an increased number of oaks, to promote which every possible facility should be given.

Permit

Section of Mr. Wm. Jones's temporary Corn Rick.

Fig: 1.

Sheaves.

2	
16	
19	
26	
41	
28	
4	132
45	
45	
45	
4	
45	
45	
45	
4	
45	
45	
45	
4	
45	
45	
45	
4	
60	
60	680
	812

Mr. Waistell's Improvement on the Dibble, or Tool for planting Acorns in Bushes.

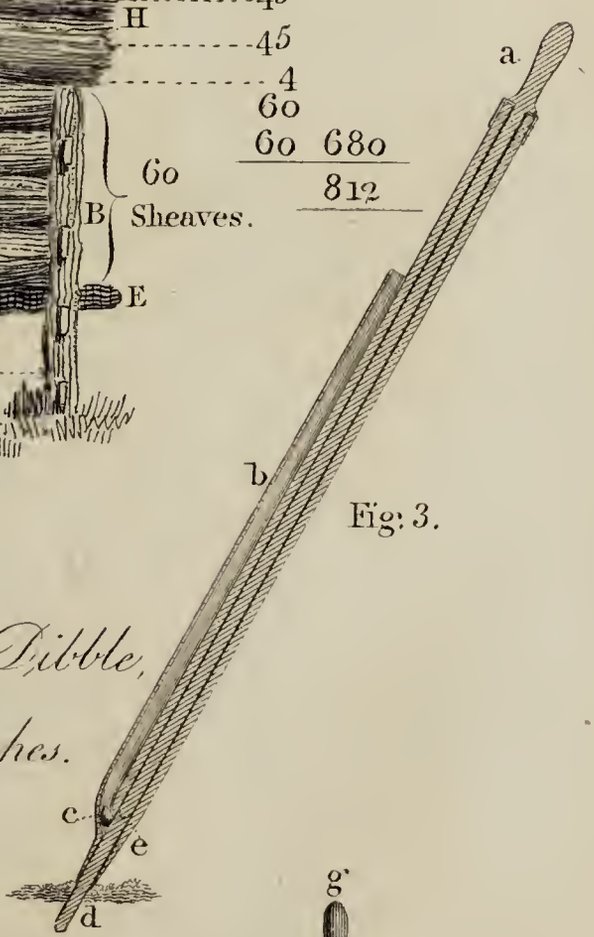


Fig: 3.

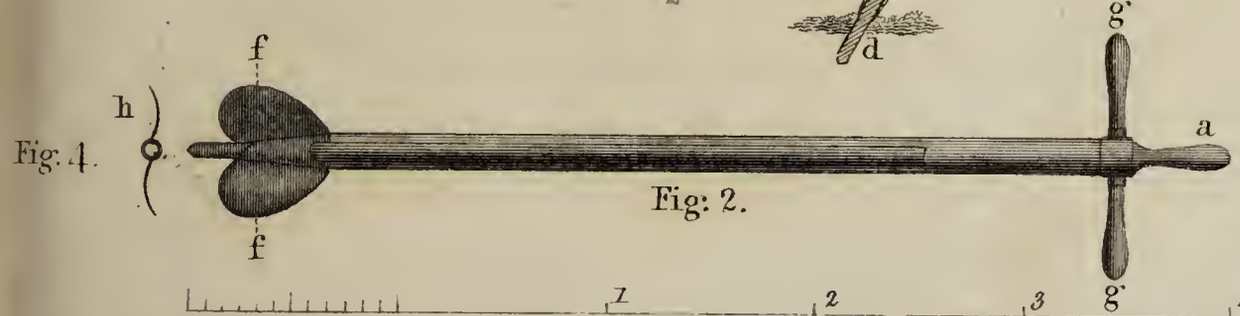


Fig: 4.

Fig: 2.

Drawn by J. Farey.

Engraved by S. Porter.

Permit me on this occasion to observe, that many proprietors of landed property are not sufficiently aware that a greater or less proportion of almost every estate, would, if judiciously planted, pay the proprietor much more than the rent it could be let for to a farmer. It would, therefore, give me great pleasure to see in the Society's volumes more communications from successful planters. I trust there are numerous persons of this description who want only to be reminded, how greatly they might benefit individuals, as well as their country, by publishing, or communicating to you, such well ascertained facts of their success as planters, as they may be in possession of; and in order to direct their attention to the nature of the information that is chiefly wanted, I beg leave to refer them to pages 80 and 81 of the Society's 27th volume, wherein numerous particulars respecting the planting, management and produce of woods, are enumerated.

I am, Sir,

Your obedient servant,

CHARLES WAISTELL.

No. 99, *High Holborn,*
June 12, 1811.

To C. Taylor, M. D. Sec.

Reference to the Engravings and Section of Mr. Waistell's Improvement of the Dibble for Planting Acorns. Plate 2, Fig. 2, 3 and 4.

a represents the handle of the dibble, which dibble is a rod $\frac{3}{4}$ of an inch in diameter, moveable in the tube of a

stave, which stave is externally about two inches diameter, *b* a tin or metal tube fixed on the exterior part of the stave, and of the same bore or aperture of the tube of the stave; when a hole is made in the earth by the point of the dibble *d*, the acorn is dropped down the metal tube, and on drawing up the dibble by its handle to the height of the letter *e*, the acorn *c* passes through a large opening into the dibble tube, and from thence falls into the hole made by the point of the dibble in the earth, when by moving backwards and forwards the cross handles *g g*, fixed on the top of the hollow stave, the soil surrounding the hole in the earth is loosened by the iron wings *f f* and deposited on the acorn. Fig. 4, *h* shows a section of the iron wings *f f* belonging to the bottom of the hollow stave.

Supposing that you wish to plant an acorn in the middle of any bush, you are to press the instrument through it into the ground, make a hole in the earth by the point of the dibble rod, then raise the rod above the hole where the two tubes communicate, drop the acorn down the tube *b*, which falls immediately through it and the lower part of the stave tube into the hole previously made by the rod, which hole is instantly covered by the soil raised by the wings. The dibble rod may be occasionally passed down the metal tube to be certain of its being perfectly clear.

The THANKS *of the Society were this Session voted to* H. B. WAY, *Esq. of Bridport Harbour, for the following Communications on the Culture and Preparation of Hemp in Dorsetshire and on the Growth of Sea Cale.*

DEAR SIR,

As you informed me when you was lately in Dorsetshire, that the Society of Arts, &c. were anxious to obtain information concerning the culture and preparation of hemp in this neighbourhood, I am induced to send you some accounts thereof.

I fear my memorandums on the subject will not be worthy the notice of the Society, and I should scarcely have ventured to have put pen to paper upon it, if I had not uniformly found, that the persons who are concerned in the growth and management of that article, are shy of giving information. If what I have sent should induce persons equal to the task, to make the needfull enquiries in this county, Somerset, Suffolk and Norfolk, (which I believe to be the parts of England where hemp is most cultivated,) and make the culture more generally known than it now seems to be, I shall be much gratified. I hope, if you again visit this neighbourhood, to show you a very fine crop of wheat on the field where you last year saw the persons employed in collecting the male hemp; also another large field of exceeding good wheat, that produced hemp last year, neither of which have had any fresh manure upon them, since the hemp was taken from the fields. I have added some observations on the growth of Sea Cale: this

useful vegetable, growing naturally on some of the Cliffs near Bridport Harbour, and being one of the most valuable esculent plants that I know, I have found the culture of it in the kitchen garden more easy to manage than has been generally supposed.

I have sent different specimens of the seed, and some of the natural soil, for inspection;

And remain, Dear Sir,

Your friend and obedient Servant,

H. B. WAY.

Bridport Harbour, March 1st, 1811.

To C. Taylor, M. D. Sec.

Account of the Culture and Preparation of Hemp in Dorsetshire.

Hemp is usually sown about the 15th of May, on the best arable land, on which about twenty cart load of good rotten dung has been spread, say about a ton to the load; this is well ploughed in, and the ground well ploughed two or three times, and well dragged and harrowed, to get the soil as fine as possible, and about two, or two and a half bushels of seed sown to the acre; what produces no seed, called by some male or summer hemp, and by others cinner hemp, is drawn about five or six weeks after the plant comes up, it is at that time in blossom; when drawn, it is tied up in bundles, and carried to some meadow land, and there spread to ripen: when ripe and dry, it is bundled and stacked. What stands for seed has no flower that can be discovered;

discovered; it is the female hemp, and is generally ripe early in September, when it is drawn, bundled up, and stowed up in the field for the seed to dry and harden, when it is thrashed out in the fields. Most commonly in Dorset the seed is sold on the spot, at from 2*s*. 6*d*. to 7*s*. per bushel; an acre of hemp produces eighteen or twenty bushels. In Somerset they have sometimes thirty bushels of seed to the acre. In the sowing season I have known 21*s*. per bushel paid for seed; when thrashed the hemp is carried to the meadows, and spread to ripen as the other, and stacked in the same way, to prepare it for sale; it is sent to the houses of the poor in the parishes round which it is raised, to be what is called scaled, that is, each separate stalk of hemp is broken in the hand, and the hemp which is the outside rind or bark, is stripped off, in which state it is sent to market. The scaling is the employment of old men, women and children, and of the whole of the labouring family in the evening, as in winter they make but poor wages of it, and one principal inducement for them to do it is, that the woody parts of the hemp make them a fire, but it soon burns out. Complaints are made of a great deal of the hemp being often wasted from improper management, and want of care in the scaling of it; at the Comptons and Bradford, a good deal more hemp would be raised if they could get it scaled, which they find much difficulty in doing; and if it were possible to construct a mill that would swingle it at a moderate expence, on some such plan as the flax swingling mills, and to afford some encouragement to the erecting them, as well as flax swingling mills, it would encourage the growth of both articles materially; an acre of hemp in a good season will produce 14, 16 or 18 weights, of 32 lb. to the weight in Dorsetshire; in Somersetshire they reckon their weight two pounds less, and they sometimes

times get as much as 35 weights to the acre; the price of the weight of hemp is from 16 *s.* to 20 *s.* per weight. The rotation of crops as follow:

On ground well manured,	Hemp.
	Wheat.
	Barley or Oats.
	Clover with the above.
	Wheat.
	Barley or Oats.
Ground well manured,	Hemp.

But sometimes they dress the ground well for hemp every third year. The quantity of hemp sown in Dorset, is very trifling in comparison to what is sown in Somerset. In the former it is chiefly confined to eight or nine parishes; whereas very large quantities are raised in Somerset, in the parishes of Misterton, Crewkerne, Hinton, St. George, Lopen, Seavingtons, Ilminster, Stocklinch, Donyatt, Kingstone, Shipton, Beauchamp, Barington, South Petherton, Martlock, Norton, Chiselborough, Stoke-under-ham, Mont-a-cute, Odcombe, the Chinniocks, the Cokers, the Comptons, Bradford, and a great many other parishes. Mr. Emanuel Pester, of Preston, near Yeovil, is in the middle of the hemp and flax county, and he can doubtless obtain and give every information that may be wished on the subject, being so extensively engaged in agricultural pursuits himself, and so competent to give that sort of information wanted; a Bounty of 3 *d.* per stone on hemp, and 4 *d.* per stone on flax, was for many years given by Government, but is now discontinued; it was paid by the Clerk of the Peace for the counties, and as the late Mr. Wallace managed that for the county of Dorset uncommonly well, it is most probable that a very

very correct return for the county of Dorset could be obtained from the office of the Clerk of the Peace for this county, of the quantity raised each year of both articles, during the continuance of the Bounty; also from Devon and Somerset similar returns could be got. There are large quantities of hemp raised in Suffolk, the writer thinks, near St. Edmunds Bury and Stow market, in that county. He has been told they make linen so fine of hemp, as to be worth 5 *s.* and 6 *s.* per yard, and used for shirts in preference to Irish, being considered much more durable and better, so much so, as to induce the Irish to imitate the fabric, and stamp the cloth, Suffolk Hemp. It is also raised in Norfolk, in the neighbourhood of Lynn and Wisbeach, but it must be watered and prepared in some other way; indeed he is convinced that all the hemp imported from the Baltic, is prepared differently from the mode used in Dorset and Somerset, and must have been swingled before it was sent to the different ports it was shipped at for this country. The giving the former Bounty on the growth, and increasing it on hemp and flax, would encourage the growth, but if given on the number of acres sown, the grower, as his ground would be in high order for a crop of turnips and wheat after, might be careless about his crop of hemp, as the Bounty to be worth notice, must be worth more than the value of the seed in common years and the labour of sowing.

Hemp in this county and the next is never sown in new ground fresh broke up, but flax always by choice, when fresh ground can be got. Mr. John Pitfield is going to break up great part of the West Clift at Bridport Harbour, and sow it with flax this season. The writer, while on the subject of hemp, is led to mention, that when travelling in the

the year 1792, in the province of Massachusets near Boston, in North America, was assured that considerable quantities of hemp were raised in the township of Sunberry, about ten miles from Boston, and that it was always raised on the same ground every year, no other crop being sown in their hemp lands, and that it was manured every year, at the rate of about ten tons of manure to the acre of hemp. Respecting seed, he cannot learn that there is any for sale at Bridport, with the buyers who purchase it up for the growers at the hemp harvest, and he expects that very little can be got from the growers round here. Somersetshire is a more likely place to get it, as he has known some of the hemp farmers to have upwards of an hundred acres of hemp in one season; round this they generally are only in a small way. A change of hemp-seed is much wanted in Somerset and Dorset. Trials have been made two or three times to get it from Russia, but it is not possible to get new seed from the interior early enough in the fall at the shipping ports, and some old seed which has been shipped has not answered the purpose; if new could have been got, it would as generally have been used for a change, as the new Riga barrel flax seed is by the flax-growers. As the seed sown in Russia was considered a good sample, and its appearance much liked, possibly it might, at a future period, be obtained in the fall from Odesea, or some other port on the Black Sea, as it is understood that a good deal of hemp shipped at Riga and St. Petersburgh, grows much nearer to the Black Sea than the Baltic; or possibly the seed of the Italian hemp raised in the neighbourhood of Bologna, or that of America, might be obtained in time to answer. Perhaps tares, called by some vetches, might be cleared from the ground early enough for manuring and sowing the ensuing crop of hemp, and

and vetches might make it worth the farmer's attention; to this an objection was stated, which I do not just now remember. On talking with the gentleman before-mentioned, and stating the American practice, with what had passed on it with my neighbours, he said, he had long been persuaded that it was a good practice, and that he had the last season a very good crop of hemp on a piece of ground that had hemp the year before, and that he did not let the hemp stand for seed, but had it all down at the usual time for drawing the summer or male hemp, and the ground immediately sown with turneps, which were fed-off with sheep, and the ground then slightly manured, and hemp sown again at the proper season, and that he had then, October 27, 1808, a piece of turneps after his hemp, which were worth 6 *l.* per acre. It is to be observed, that the acre here meant is the British acre of one hundred square poles, three hundred and four square yards each. The manure mostly used for hemp is good rotten stable dung, which is much preferred to any other, though lime is frequently used; but manufacturers pretend to assert, (with what foundation I cannot say), that they can distinguish a material difference in the quality of the hemp, where lime has been used instead of dung, as from lime they say hemp is more harsh and brittle, and not of such a soft silky quality as where dung has been used. The writer has endeavoured to throw together every thing that occurs to him on the subject of the culture of hemp, which, from being born and residing great part of his life in a part of the county where it has been extensively cultivated for ages, he has been able to collect; but where it is not very easy to obtain direct information, as both the growers and manufacturers are very shy of giving any, under an idea that it might injure their own interest by assisting to extend

the

the culture to other countries. He believes that his statement may be depended upon, but he is no farmer, and therefore the loose hints thrown together here on the subject may not be so clearly and satisfactorily explained as he could wish, but if they in the smallest degree assist in encouraging the growth of an article so essential to the welfare and prosperity of the kingdom, it will afford him the most heartfelt pleasure.

H. B. WAY.

Account of the Culture of Sea-Cale, or Sea-Kale.

THE mode which I consider the best for the culture of sea-cale, is to draw lines in a very dry soil and dry situation, on ground with a southern aspect, about two feet one way by about eighteen inches the other, and where the lines cross to put in three or four good perfect seeds in a square or triangle, about three inches apart; this may be done any time in November or December in open weather, and it will require no other care afterwards but keeping the ground clear from weeds till the autumn of the following year, when all the plants but one of the finest in each square may be taken up, which if wanted will serve to form other beds set the same distance apart. The ground in the intervals of the plants should be dug in the spring and fall of the year, taking care not to injure the plants. The leaves should be left on the plants till they fall off naturally, which will not in general be sooner than the latter end of November. In the autumn

autumn of the second year the same attention should be paid to the plants, and to remove the dead leaves.

In the third year, about the middle or latter end of November, when the leaves have been cleared away, and the ground dug, each plant should be covered over close with a tub, pan, a heap of small stones, coarse cinders, or coarse bark, raised about ten or twelve inches over the crown of each plant, and from about the latter end of February to the latter end of March the plants will be very fine and fit for use. I prefer that which has been bleached with our round sea-gravel, about the size of large peas or beans, to any other mode whatever. The plants should be cut but once in a year, as cutting it oftener weakens and lessens the size of the plants. If it is not desired to have the plants large they may be bleached and cut a year sooner.

I have sent a specimen of the sandy soil in which it grows naturally here, as I think the generality of gardeners are too careful, and manure the ground too highly for it. In the month of April last, after cutting my plants, I covered the ground all over, at least six inches above the crown of the plants, with this earth, they soon shot up through it, and never looked finer or produced a larger quantity of good seed than that year.

I am thus particular in order to show that this vegetable will succeed as well, if not better, in poor ground than in rich, provided the soil be dry, and care taken in the management; I speak from long experience, having been well acquainted with the management of this valuable plant from my youth. When I cut the sea-cale for use, I immediately draw up the earth with a trowel, so as completely to cover the whole of the plant; this I fancy makes them grow more luxuriantly. This plant, if properly managed, is superior to

asparagus

asparagus, and if more is cut than wanted for immediate use, it will keep for some days in a pan of cold water, but of course it cannot be better than when recently cut. It precedes the use of asparagus, being ready for the table in February and March.

H. B. WAY.

PAPERS

PAPERS

IN

CHEMISTRY.

The Silver Medal *of the Society was this Session voted to* H. B. Way, Esq. *of Bridport Harbour, for his Method of preparing a cheap and durable Stucco, or Plaster, for outside or inside Walls. The following Communications were received from him, and Specimens of the Stucco, and of the Sand from which it was made, are preserved in the Society's Repository.*

SIR,

In consequence of your expressing an opinion that a general knowledge of my method for preparing a stucco, or plaster, for outside walls of houses much exposed to sea breezes or bad weather, would be of service to the public, I have inclosed an account of the process, and I will with pleasure furnish any further particulars of this business for the Society of Arts, or permit any gentleman to examine it who

may wish for more information on the subject. You know the situation of my house, which is greatly exposed to the spray of the sea and bad weather; and I can truly add, that by means of this stucco it is perfectly free from damp, and the plaster remains compact and durable.

I remain, Sir,

Your obedient humble servant,

H. B. WAY.

Bridport Harbour, Oct. 12, 1810.

To C. TAYLOR, M. D. SEC.

To make a strong Stucco, or Mortar.

Three parts Bridport Harbour-sand to one of lime, both finely sifted, and mixed with lime-water; if used as stucco, the first coat to be laid on half the thickness of a crown-piece; let it remain two days, then with a painter's brush wash it over with strong lime-water, and lay on the second coat of the same thickness.

1805, March 25.—Measured a coal half-bushel of Beamister lime, and put it into a hogshead of water, to make the lime-water.—Measured two coal half-bushels more of the lime, slacked and sifted it, it then measured three half-bushels, to which were added nine coal half-bushels of Bridport Harbour-sand well sifted; I saw it well mixed up with lime-water, and thoroughly worked together; the next day saw it turned, and again mixed up, that it might be well incorporated together.

27th.—This morning had a fine coat of it laid on the west end of my large storehouse at Bridport Harbour.

29th.

29th.—Had it washed with lime-water, and a second coat laid on.

Cost.

	s.	*d.*
One sack and a quarter of lime, at 2*s.* 6*d.* -	3	$1\frac{1}{2}$
Two men and one boy two days each, fetching and mixing up materials, and laying on; men 2*s.* 3*d.* per day, boy 10*d.* per day, and one pint of ale each per day, 12*d.* - - -	11	$10\frac{1}{2}$
	15	0

N. B.—I suppose the expence rather over than under-rated.

May 11.—This day Thomas Everett measured and examined the work, found it hard and sound, $24\frac{7}{9}$ square yards, a little done to the house, suppose the whole to be twenty-five yards square.

Twenty-five square yards at $7\frac{1}{4}d.$ per square yard, would be 15*s.* $1\frac{1}{4}d.$

June 13, 1806.—Examined the work, which was perfectly sound and free from cracks, nothing having ever peeled off from it. The situation exposed to the weather in the greatest degree.

N. B.—The coal half-bushel above-mentioned holds exactly thirteen gallons wine-measure.

H. B. WAY.

SIR,

I WAS favoured with yours of the 18th instant, and I now enclose the mason's certificate of the quantity of stucco done with the composition I gave him the particulars of, in addition to which it may be necessary to mention that the coal half-bushel, with which the ingredients of the composition were measured, (according to the account formerly given,) contains exactly thirteen gallons of water, wine measure, and would hold exactly 1 cwt. 1 qr. 7 lb. net of the sand used; the weight of the lime I do not know, and my being able to ascertain exactly the weight of the sand, arose from my waggon being employed to carry what was used at Yeovil and East Coker, from hence and for what I sent to Yeovil, I was paid 1 *s.* 9 *d.* per cwt.; from the sand here succeeding so well, Thomas Everett would not be prevailed on to engage to do any of that sort of work with hill or river sand, to be got on this shore. The work he did for me was all by the day; what he did at Yeovil and East Coker he agreed for at eight pence per yard, of nine feet superficial measure for labour only for the two coats, at four pence per square yard for one coat, all the materials being brought to the spot at his employer's expence, and who also found scaffolding and scaffold ropes; this, I think, is considerably higher than by my calculation of the expence of what I had first done he ought to have charged; but its being done at a distance of twenty miles from where he lives, and in the most busy time of the year for masons work, I suppose must account for it in the first instance, and having once made that price, he would not now work under; but I believe, for a considerable building, and with sufficient notice, and being allowed 6 *d.* per mile in lieu of wages and travelling expences for himself

self and an assistant, out and home, he would go to any part of the kingdom, on being paid 8 *d.* per yard for the work. It has been the general received opinion here, that plaster made with sea sand, unless well washed in fresh water, would be always damp, but, on the contrary, I find from what has been done in my dining-parlour and passage, it has been always quite dry, although the whole of the sand with which it has been done has been thrown up by the sea, and must have been always at spring tides covered with sea water; indeed, it sometimes happens that, for months together, there is none to be collected on our shores at this place, that Everett thinks fine enough for the purpose, and as I am now and then applied to for getting it, I have lately, when my horses were at leisure, got a small quantity collected and hauled in for my own use, or, in case of its being wanted, I charge 2 *d.* per cwt. for it, where it is deposited. As I design at some future time to make some alteration in the passage done with the stucco in April 1806, I had four pieces taken off, which I tied up separately, each in a piece of brown paper, and had them packed in a box, with a layer of sand between each piece, and at the bottom and top of the box, and directed it for you, and sent it with some goods I shipped on Saturday last to my friend Netlam Giles, Esq. No. 2, New Inn, St. Clements. I have requested of him that he will have the goodness on its arrival to forward it to you. The vessel it goes by is the sloop Mary Anne, John Anning, master, bound to Dounes Wharf, Hermitage, Wapping. It is possible that the pieces of stucco sent may imbide some of the saline particles from the sand it was packed in, but this did not occur to me at the time, or they should have been packed in saw-dust, as they were perfectly dry when packed, so much so as, when struck upon with the knuckle, to give a sound similar to what an earthen vessel would do if dry and not

cracked. Should there be any further information requisite, on your letting me know, it shall immediately be sent you. It had almost escaped me to say, that the small quantity of six yards, done last October with stone lime for trial, was done from your intimating to me, when I had the pleasure of seeing you in Dorsetshire, that stone lime was likely to answer; but it would I think look better if white-washed; the difference in point of expence is materially in favour of the stone lime. The cost of my waggon-load of it at the kiln, about a mile from hence, would be only 10 *s.*, whereas about the same quantity of chalk-lime at the kiln, full eight miles frome hence, would cost 1 *l.* 4 *s.*, and I cannot get any chalk-lime nearer. I have only now to add that I am, very respectfully,

Sir,

Your obedient humble servant,

H. B. WAY.

Bridport Harbour, April 22, 1811.

To C. Taylor, M. D. Sec.

Certificate.

I hereby certify, that Mr. H. B. Way, merchant, of Bridport Harbour, in the county of Dorset, in the month of March 1805, gave me the necessary directions for making a strong cheap stucco or plaster, which was composed of one part chalk-lime, and three equal parts of fine sand, collected on the sea shore, near Bridport Harbour, the whole of which was mixed up to a proper consistence with a strong lime water, and I have since that time done the annexed work with the said composition.

Date

Date.	For Mr. H. B. Way, at Bridport Harbour.	Yards.	Yards Flat Measure.
1805. March.	On the outside of a warehouse wall, part rough stone and part brick.	25	
1806. April.	On the inside walls of a passage in his dwelling-house, on rough stone.	10	
October and November.	On the inside rough stone walls of two cellars.	224	
	One coat on the ceilings of the said cellars. N. B. The first coat on the ceilings was common hair mortar.	228	
1807. April and May.	The whole of the outside of his dwelling-house, rough stone walls.	335	
August.	On one side wall of the dining-room in brick; this stucco was rubbed down quite smooth, and has since been painted with oil colours.	13	
1810. October 10.	On a rough stone wall of a warehouse directly fronting the sea, and not two hundred yards from it, with common stone-lime, such as is used for manure in this quarter by way of trial.	6	
			821
1811. April.	At Mr. H. B. Way's request, I have this day carefully examined the whole of the above work, and I find it sound and good, and by his directions, four pieces of the stucco were taken off from the passage wall, (which was laid on April 1806,) and packed in the same sort of sand as is used in the composition, and sent by him directed for the Secretary of the Society of Arts, Manufactures and Commerce, London.		
	For Peter Daniel, Esq. of Yeovil, Somersetshire.		
1808. May and June.	On the outside brick-walls of his dwelling-house there.	430	
1810. May and June.	On the outside brick-walls of other dwelling-houses there, for W. Hellyer, Esq. of East Coke, near Yeovil.	480	
			910
1809. June.	On the outside brick and rough stone-walls of his dwelling-house, at that place.		1040
	For the Rev. Joseph Fawcett, of Yeovil.		
1810. June.	On the outside rough stone-walls of his dwelling-house there.		212
	N. B. Mr. Fawcett's house being built the year before, with a view to being stuccoed, the walls were left rough.	Yards.	2983

I hereby

I hereby certify, that the whole of the foregoing two thousand nine hundred and eighty-three square yards of stucco, were done with the before-mentioned composition, by me and my men under my directions, and I verily believe it is the cheapest stucco known, and that it will prove very durable, both without doors and within, and that it has given entire satisfaction to the gentlemen who have tried it; and I am now engaged, if I can the ensuing summer, to stucco the outside of one house at Bridport, and another at Yeovil, also the inside of a cottage for labourers that I have just built for Mr. H. B. Way, at Bridport harbour.

THOMAS EVERETT.
Stone Mason, Bricklayer and Plasterer.

Shipton George, near Bridport,
Dorset, April 22, 1811.

Witness, JAMES BUDDEN.

PAPERS

IN

MANUFACTURES.

In Page 109, of the 28th Volume of the Society's Transactions, will be seen a Communication from Mr. EDWARD SMITH, *of Brentwood, on manufacturing a variety of Articles from the Fibres of the common Nettle, for which he has received their* SILVER MEDAL; *he has since, with great attention and laudable Industry, extended his Experiments on this Subject, and, during the last Session, produced to the Society Specimens of Cloth and Cordage made from the Nettle, which appear to possess great Strength and Durability. The Society have, therefore, this Session, voted to him their* SILVER ISIS MEDAL. *The following Communication was received from him, and Specimens of the Cordage and Cloth made by him from Nettles, are preserved in the Society's Repository.*

ESTEEMED FRIEND,

I RECEIVED thy kind favour of the 23d instant, by the contents of which I am much obliged, and being impressed by

by the consideration of the vast importance the introduction of a new substance of productive labour would be of to the community of this manufacturing country, particularly as affording a new source of industry to the increased numerous poor of both sexes, in truth, so operated on my mind, as to create a great unwillingness to suffer any exertions consonant with my limited powers, from total disadvantages, to lay dormant: I am, therefore, very desirous by unremitted endeavours to be instrumental in disseminating the knowledge of, and the means of bringing into use, so valuable a spontaneous production as the common nettle substance, under the sanction and through the medium of the enlightened Society of Arts, &c. These considerations, aided by the hope of obtaining their further approbation, have stimulated me to persevere in my attempts to contribute all in my power towards the advancement of so desirable and beneficial an object, in the expectation that when all the different fabrics which that substance is capable of being converted into, are produced, it may have a greater tendency towards encouraging others to embark in a manufactory thereof, than volumes written on the subject. With these sentiments, I am induced to trouble thee farther, in requesting thou will be so kind to favour me by laying before the Society the different specimens of manufactory from the nettle substance, which I have at present in readiness, and which will be sent to thee by the Brentwood coach, which inns at the Blue Boar, Aldgate, and I expect will be delivered soon after the receipt of this. The cordage Nos. 1 and 2, is affirmed by the cord-spinner to be of equal strength to that made from hemp. The cloth No. 1, is rough from the loom; No. 2, the same fabric half bleached; and No. 3, which I ordered to be *Huckaback*, also is only half bleached for want of sufficient time for the process. The

quality

quality of the cloth hath suffered throughout, by the negligence or willfulness of the manufacturer, and is principally owing to the raw material having been only passed through such heckles as are used for the coarse part of the hemp manufactory;—other necessary operations were omitted, in consequence of my instructions not being attended to by the persons into whose care it was entrusted. He resides in the country, at a great distance, and his capability and integrity proved greatly inferior to the opinions I had entertained of him; and it now appears his practice is confined to the coarser part of the hemp manufactory. It was my intention to have produced with the above a pair of stockings, manufactured on the principle of cotton, and also a specimen of fine cloth on the same principle, with a view to shew the great extent of contrast; but, on application to a cotton spinner, I found the quantity of material I had in a state of preparation suitable was not sufficient for the operations of carding; in consequence I am obliged to postpone my designs till I am enabled to prepare a sufficiency. Greatly desirous of contributing to the accomplishment of the object in view, and sensible how much the sanction and approbation of the Society would tend to promote it, I hope they will consider my continued exertions worthy their farther attention. Anticipating their approbation, I remain,

Very respectfully,

Thy Assured Friend,

EDWARD SMITH.

Brentwood, the 26th of 3d Month, 1811.

To C. Taylor, M. D. Sec.

Ten

TEN GUINEAS *were this Session voted to Mr.* JOHN ROBERTSON, *St. Mary's Wind, Edinburgh, for an Improvement in Machinery for Weaving Tartan or Plaid Hose. The following Communication was received from him, an Explanatory Engraving is annexed, and a Model of the Machine, and Specimen of the Work, is preserved in the Society's Repository.*

MUCH RESPECTED SIR,

THE highly honourable and useful Society for the Encouragement of Arts, Manufactures and Commerce, with which you are officially connected; and from a former instance of their and your attention to me, emboldens me again to call their discriminating taste and judgment to the inclosed draught and description of a machine, for the more expeditious working of Tartan Hose on the stocking frame, as also one done by the invention;—an article essentially necessary in the *Highland garb*, the dress of the *Conquerors of Egypt*, and the more than *match* for *French Invincibles!* Tartan, or diamond hose, from the present tedious manner of working so many threads, (eleven in number) and although the hose are not much above one half of the length of common stockings, yet they are rated to the workman at the price of two pair of hose of the same gauge on the same frame; therefore it gives me much pleasure to send you an invention that will facilitate the operation, and save more than half of the time formerly taken; consequently it will prove of great advantage to that part of the community of Scotland who use that dress; besides,

Mr. John Robertson's Machine for weaving Tartan.

Fig: 2.

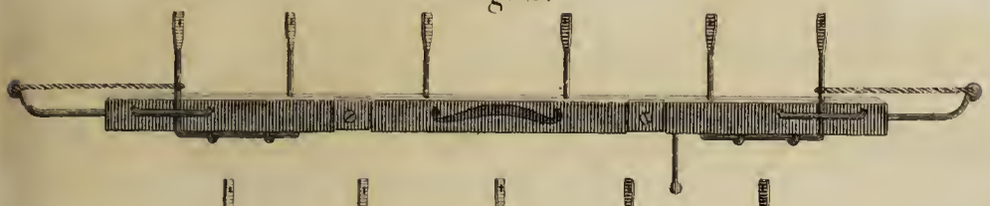


Fig: 3.

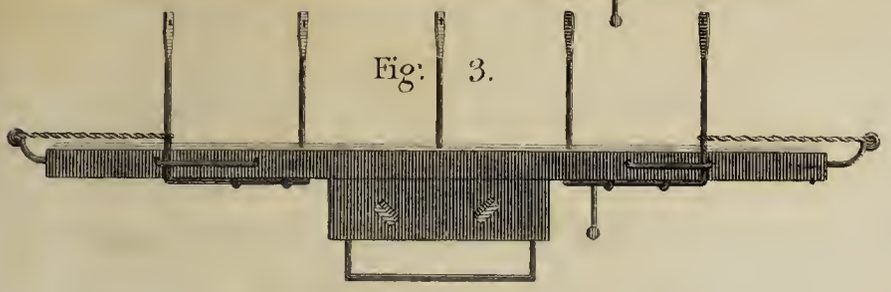
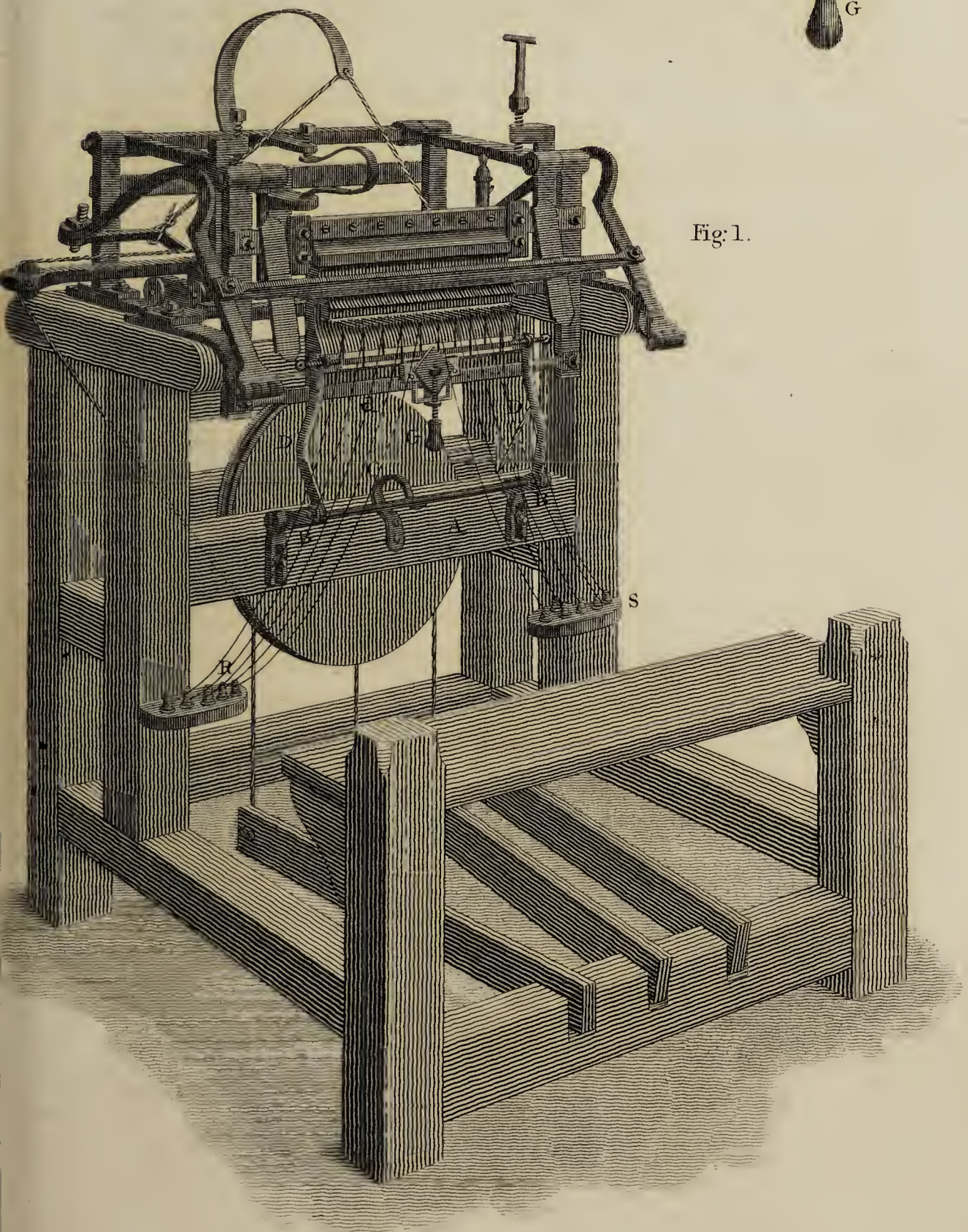


Fig: 4.

Fig: 1.



n by J. Farey.

Engraved by S. Porter.

besides, the machine will also prove of use in fancy work of different designs, for by it the diamond may be made from a quarter of an inch to two or more inches square, and of any guage of a frame, although the pattern hose is coarse, it being done on a twenty-four inch guage frame that I put the machine to.

I have only further to observe, as will appear upon the Society's investigation, that the invention is truly simple, and the expence of the machine, independent of the stocking-frame, will cost but a mere trifle. Your communicating to me the result of this application, will oblige,

Much respected Sir,

Your most obedient,

and very humble servant,

JOHN ROBERTSON.

St. Mary's Wynd, Edinburgh,
March 8th, 1809.

To C. Taylor, M. D. Sec.

Certificates.

We have examined Mr. John Robertson's invention, and we are happy in declaring that it deserves encouragement, as the machine in operation will save a great deal of time in making tartan hose.

James Baird, Hosier.

David Yair.

William Vair, Stocking-frame Smith.

Edinburgh, May 6th, 1809.

Explanation

Explanation of the Drawings of Mr. Robertson's Machine, for Weaving the Tartan Plaid. Plate 3.

THE tartan hose are woven in the same manner as other hosiery, on a stocking-frame, except that threads of two different colours are employed, and these are disposed in diamonds, of the two colours, disposed alternately. The mode of operation of the stocking-frame is difficult to describe in words, though it may be readily comprehended, from an attentive inspection of the machine in action; on this account the Society deem it unnecessary to enlarge the following account of Mr. Robertson's invention, by a minute description of the stocking-frame delineated in the plate, especially as the majority of persons who will feel an interest in this communication, are already perfectly acquainted with its mechanism.

The ordinary method of weaving the tartan in the stocking-frame is to have as many different threads as there are diamonds in the width of the hose to be woven. These (eleven in number) are laid one by one, the different colours alternately, upon the needles of the frame; and then by the motion of the jacks and snikers, the threads are knitted upon the needles, and formed into the hose, the colour changing at the places where the different coloured threads were laid on the needles; as the work proceeds, the number of needles, one of the coloured threads is laid over, must be increased, and the other colours diminished in the same proportion, to give the figure of diamonds of the different colours; all these movements are effected with ease by the machine delineated in plate 3, where fig. 1, shows its application to the

the stocking-frame, and the other figures the developement of its parts; it is fixed to the fore rafter A of the stocking-frame by screw bolts which admit of its adjustment; the pieces thus fixed support the pivots of two short arms B B, connected by a cross-bar, upon which the spring C operates, to sustain the weight of the machine; D D are two arms joined to B B extending to the facing-bar *d* of the frame, and connected by a cross-bar E, in which are two sliders, shewn separately in figs. 2 and 3, moving in grooves of the bar E; the slider, fig. 2, has 6 guides fixed in it; they are pieces of wire, with an eye through each to receive the thread; 4 of these 6 guides are fixed in the bar, but the two end ones are fitted to slide under wire eyes or staples, fixed in the underside of the slider: they have a constant tendency towards the ends of the sliders, by small spiral springs shewn in the figure; the slider, fig. 3, has 5 guides or needles, 3 fixed into it, and the two outside ones moveable as before-mentioned. The different coloured threads are put through the eyes of the guides, one colour to the top slider, and the other to the lower, and as the work proceeds, are drawn off the small bobbins R S, arranged on the sides of the frames; by this means 11 threads are presented to the needles at once, and the sliders, figs. 2 and 3, being moved endways by hand, lay the different coloured threads along upon such a number of needles as their motion allows; the number of needles, as before-mentioned, must be increased one needle, for the threads of one colour, and diminished as much to the other; at every stroke of the machine, to produce this effect, the quantity of motion allowed to the sliders, must be altered the space of one needle every time; thus, the upper one, for instance, must at first slide the whole breadth of the diamond, except one needle, and the lower slides only

only the space of one needle; in this position the diamonds produced by the threads of the upper slider will be at their greatest breadth, while those of the lower are only the points of the diamonds; every succeeding stroke the machine makes, the upper slide must have its motion diminished the space of one needle, and the lower one increased in the same degree, because the diamonds produced by one are widening, and the others narrowing; this continues till the lower slide moves the whole breadth of the diamond, as the upper one did at first setting out, and then the action is reversed: the upper one being on the increase till it gets to the full width again, when a diamond will have been completed. This variable motion of the two sliders is regulated by a square, shewn in fig. 4, exactly the same size and figure as the diamond; this is situated as shewn in fig. 1, and the sliders have pieces projecting from them, which stop against the egdes of the square, which is moved every course, by turning the screw G, one turn in its socket, which is connected with the bar E. By this means the reader will see that the movement of the sliders will be as above stated; the screw must have twelve threads per inch for a stocking-frame of a twenty-four inch guage, then there will be twenty-two leads, or forty-two needles, in the widest part of each diamond, which will be $1\frac{6}{8}$ across; for a thirty inch guage, the screw must have fifteen threads per inch. The outside guide of both sliders do not partake of the motion of the sliders, because they are to produce the selvedges of the hose; making half diamonds, which become whole ones when the stocking is sewed; these guides, as at first explained, are not fixed to the sliders, but have a sliding movement endways, the springs always drawing them out, and they are stopped by the ends of two screws, attached

tached to the ends of the bar E, as may be seen in fig. 1; these screws being turned, will adjust the selvage needles, as is required for the breadth of the hose, and for narrowing it when it comes to the small part of the leg. By this machine, the whole of eleven threads may be laid upon the needles, in the same time that two could be done in the common way, and without necessity of counting the needle, to increase and diminish the different coloured diamonds.

PAPERS

IN

MECHANICS.

The SILVER MEDAL *was this Session voted to Captain* T. M. BAGNOLD, *of the Royal Marines, High Row, Knightsbridge, for his Invention of a Gun and Carriage, to clear the tops of the Enemy's Ships from Marksmen in close Action. The following Communication was received from him, an Explanatory Engraving is annexed, and a Model of the Gun and Carriage, are preserved in the Society's Repository.*

SIR,

I HAVE the honor to transmit you a model of a gun and carriage, invented by myself for the purpose of protecting our naval officers, from the enemy's marksmen in close action, and a paper, descriptive of it, which I beg the favor of you to lay before the Society, and which, considering

the end proposed, I trust they will deem not altogether undeserving their notice.

The melancholy loss sustained by the navy, by the death of Lord Nelson, who fell by a marksman in the enemy's top, first suggested to me an idea of a carriage, which, by scouring the tops of an enemy in close action, would greatly diminish the loss among our officers and men quartered on the upper deck, and greatly injure the enemy's running-rigging, in a part where many material ropes are of necessity collected.

I am, Sir,

Your obedient humble servant,

T. M. BAGNOLD.

7, *High Row, Knightsbridge,*
March 12th, 1811.

To C. Taylor, M. D. Sec.

Description.

The lower part of the model is made to represent part of the deck of a ship of war, either gangway, poop, forecastle, or quarter deck, on which the carriage traverses round a bolt, which passes through a beam and forelocks in the carriage. As the hole through the beam for the bolt might weaken it, it might be passed through a piece of elm or oak between two beams, and thus rather strengthen than weaken the frame.

The construction of the carriage will explain itself.

The gun is elevated by a rack and pinion, and may be retained

Captain T. M. Bagnold's Improved Gun and Carriage.

Fig: 1.

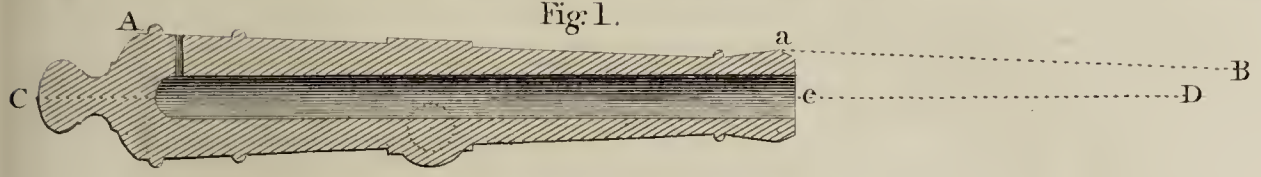


Fig: 2.

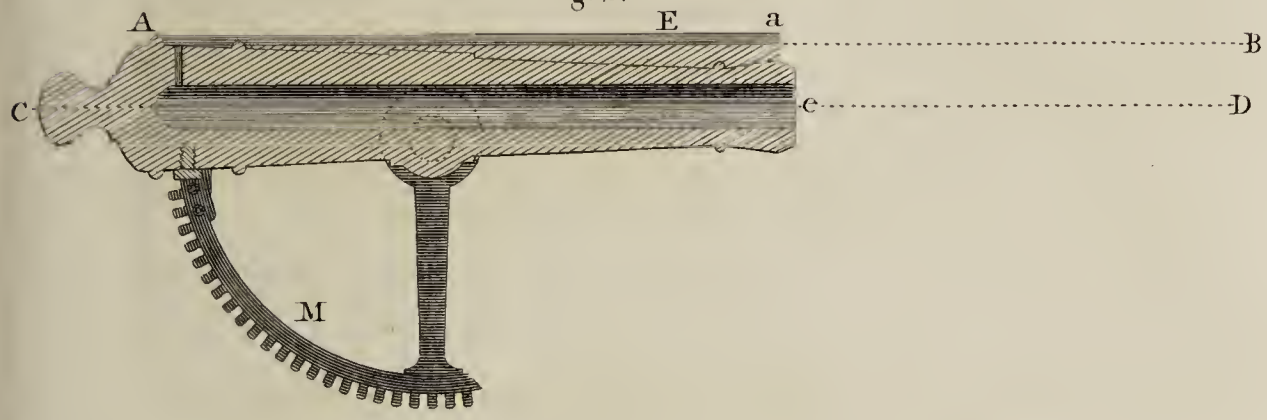
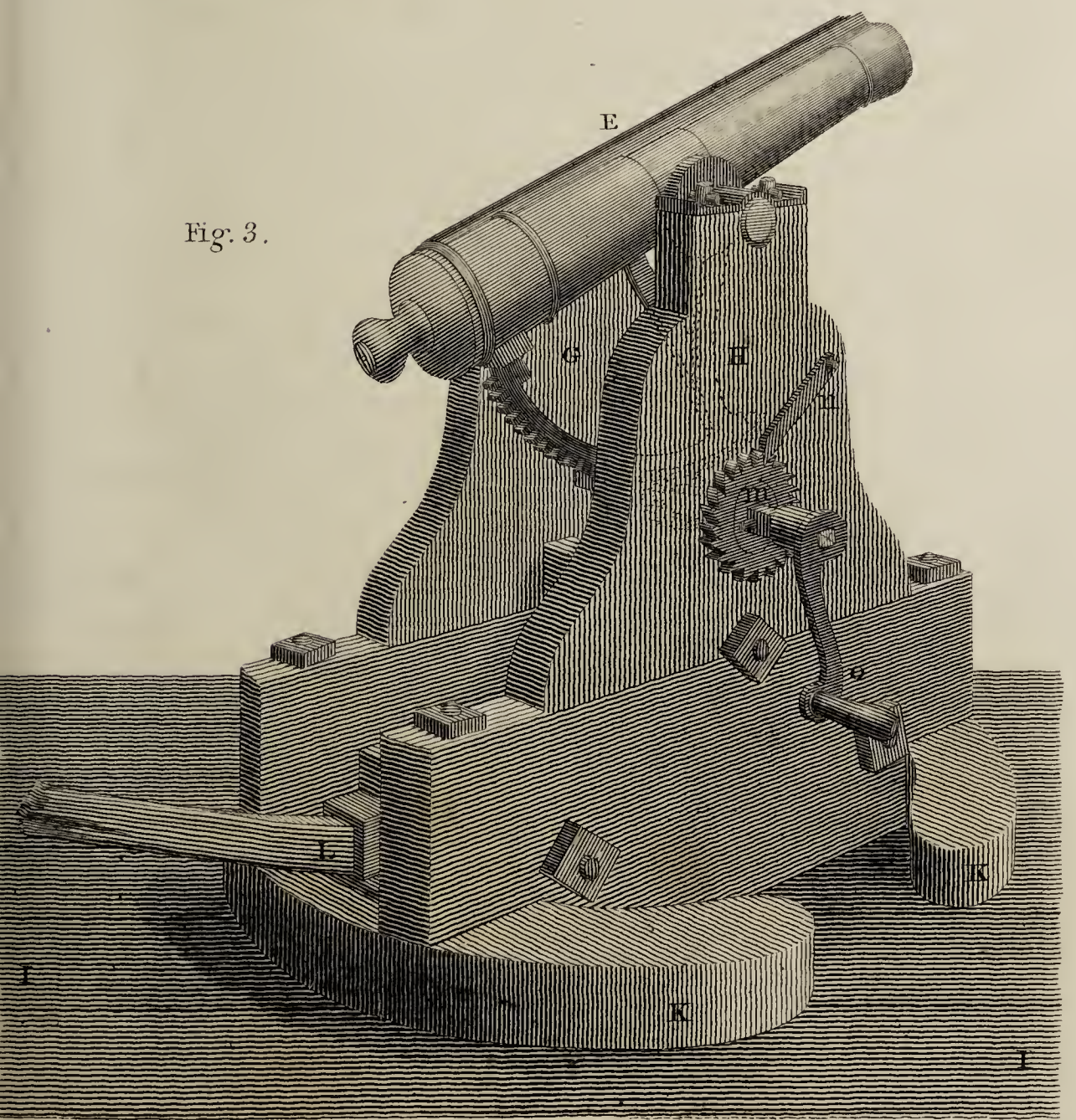


Fig: 3.



Engraved by S. Porter.

retained in any position by the tooth-wheel, and catch on the right cheek of the carriage.

Firing in the navy is rendered *uncertain* and *incorrect*, by the roll of the vessel altering the elevation; and as it is impossible for the seamen to keep his eye for the elevating sight, and directing one at the same time, I have endeavoured to remedy the defect, by placing a bar of brass on the top of the gun, which, by correcting the difference of diameters at the muzzle and breech, renders the lines of flight and sight parallel to each other at one view, and therefore reduces the necessity of two sights to one, and enables the seaman to keep his eye on his object till the moment he fires, in this instance particularly necessary; on the upper surface is a groove, similar to that on a double fowling-piece, which renders the aim of the gunner, at the short distance this gun will ever be wanted for, an absolute and rifle-like certainty.

Mode of Firing.

In firing a common long nine-pounder, eight men are usually required; whereas, two men and a boy are sufficient for this gun. One points, primes, fires, and stops the vent; the other sponges, loads and winds up; the boy supplies ammunition. The man who fires, directs the gun by the handspike, and keeping his eye along the sight, orders the man who winds the gun up when to stop, and fires directly at his object, by means of the lock string; and as the gun has no recoil, the marksman safely keeps his eye to it till he fires, and with a little experience may strike a small object with the greatest certainty.

It may be objected, that the carriage could not stand the explosion without being allowed a recoil.

I answer, when this gun is used, it will be at *very close quarters*, and at a *very great elevation*, at 60″ or 70″; consequently the recoil is nearly downwards, and as cannister shot will be the best on these occasions, from four to eight ounces of powder will be a very full charge for one hundred and forty musket balls; more would only scatter them, and spoil the effect, particularly as one hundred yards is the greatest distance it will be ever wanted; for if the gun should be bored with a chamber, on the carronade principle, less would do, as in those guns, from one-twelfth to one-sixteenth of gunpowder, in proportion to the weight of the shot, is all the powder allowed for long ranges. And by lining round the head of the carriage with strong plates of iron, which passing under the arm of the gun, should be bolted together through all; the carriage would be rendered sufficiently strong to bear any explosion whatever. I tried the experiment on a brass twelve-pounder, in a frame work carriage, and found a satisfactory result, and saw, in the lines off Flushing, two brass twenty-four pounders on a construction something similar. Should brass be objected to on the score of œconomy, I answer, iron would do as well, and a short gun as well or better than a long one. As the carriage is put together with screw bolts, it may, in case of necessity, be taken to pieces and put below.

T. M. BAGNOLD,
Captain Royal Marines.

Reference

Reference to the Drawings of Captain T. M. Bagnold's improved Gun and Carriage. Plate 4. Fig. 1, 2, and 3.

Figs. 1 and 2 of this plate shew the difference of the common ship's gun, with the improvements before us; in fig. 1, which is the common gun, the line C D is the axis or central line of the caliber of the gun; and A B is the line of sight by which it is pointed; this line, which touches the largest part of the breech at A, and the muzzle at *a*, is not parallel to the line C D, which is the flight of the shot, because of the greater thickness of the gun at its breech; this obliges the gunner to employ two lines of sight; the one A B, which is on the top of the gun, he uses to point the gun in its horizontal direction; and another line by the side of the gun, and therefore in the same plane as C *c*, he uses to give it the proper elevation. To avoid the necessity of thus recurring to two sights, Captain Bagnold has applied a brass bar E, figs. 2 and 3, upon the top of the gun having a groove along it, which is exactly parallel to the line of flight, as shewn by the dotted lines, (to which the same letters apply as for fig. 1,) and being also parallel to it in the horizontal direction, it serves to point the gun at one observation.

Fig. 3 explains the construction of a carriage for this gun, G H are the two cheeks made of very strong plank, and united by cross pieces and strong bolts; the lowest of these pieces, which is in the centre of the frame, has a hole through it, to receive a very strong iron bolt which is fastened into the deck, I I; and upon this bolt the gun and carriage traverses horizontally; K K are two curved pieces of timber fastened to the cheeks G H; these resting upon the deck, cause the carriage to stand firmly; it is turned about by the

handspike L, to direct the gun horizontally; to give it the requisite elevation, a quadrant M, fig. 2, is fixed to the two trunnions and the breech of the gun; and having teeth on its circumference, is moved by a pinion (shewn dotted in fig. 3,) fixed on an axis, passing through the two cheeks of the frame; on the end of this, a ratchet wheel *m* is fixed, and a click *n* holds it up: the pinion is turned round by a winch *o*, which affords the means of elevating the gun with the greatest ease and accuracy, to point to any object by the sight E; the carriage must be framed with the greatest strength to resist the recoil of the gun, which will act much more powerfully upon this than the common gun-carriage, because it cannot run back when fired.

The following Certificates were produced.

From ADMIRAL E. HARVEY, stating that he had examined Captain Bagnold's model of a gun and carriage, and that a gun for this purpose is a desideratum in the service, particularly when the marksman can fire without previously moving from his aim, and thereby avoid the uncertainty that would otherwise result from the motion of the two vessels.

From ADMIRAL Sir ROGER CURTIS, stating that he had inspected Captain Bagnold's model, and is of opinion that if the gun and carriage is made transportable, for being fired from various situations as may be found necessary, that a gun so mounted would in close action be very useful for the purpose for which it is intended; and that several Naval Officers to whom he had shewn it expressed the same opinion.

From

From COMMODORE I. ROWLEY, stating that he had examined the drawing and model of Captain Bagnold's gun, for dislodging marksmen from the enemy's tops in close action, and had shewn them to several of his brother officers, who agreed with him in opinion of it being likely to answer that intention; and that the proposed object is no doubt of considerable importance in an engagement at sea.

From CAPTAINS Sir ROBERT LAURIE, W. M. COURTENAY, KEITH MAXWELL, JOHN RICHARD LUMLEY, and M. HEAD, all of the Royal Navy, stating that they had examined the model of the gun and carriage, invented by Captain Bagnold, for clearing the enemy's tops of marksmen in a close action, and are of opinion that it is well calculated for that purpose, would be highly beneficial in its effects, and appears to them better constructed to answer its end with precision, then any thing of the kind yet invented.

From LIEUTENANT CHARLES HOPE SMALL, of the Royal Artillery, stating that he had examined the model of a gun and carriage, invented by Captain Bagnold, for the purpose of dislodging marksmen from the enemy's tops in close action. That as the elevation in this case must be great, and the distance small, the charge of powder for carrying grape or cannister shot will be very trifling, and that having had some experience in his Majesty's Navy, he is of opinion the gun is well calculated to produce the intended effect.

The

The SILVER MEDAL *was this Session voted to Mr.* WILLIAM BRUNTON, *of Butterley Iron Works, in Derbyshire, for an Improved Pump, for raising the Water whilst Wells are sinking or making. The following Communication was received from him, an Explanatory Engraving is annexed, and a Drawing of the Machine is preserved in the Society's Repository.*

SIR,

I BEG leave through you, to lay before the Society for the Encouragement of Arts, Manufactures and Commerce, drawings of a pump upon an improved construction, for the purpose of raising water from pits, whilst they are sinking. Before I enter upon an explanation of my plan, it will be requisite to state those inconveniences arising from the common mode, which are intended to be obviated.

First, as it is necessary for the pumps whilst sinking, to be always working upon air, that the water may be kept very low in the pit, the engine of course frequently goes too fast, and carries up by the violence of the current small pieces of stone, coal, or other substances, and lodges them above the bucket, which must considerably retard the working of the pump, and wear the leather.

Secondly.—When the engine is set to work, (after having been stopped whilst working upon air, and consequently a quantity of air remaining in the suction-pipe, with the small stones, &c. deposited on the valves of the bucket,) it often happens that the compressure of the air by the descent of the bucket, is not sufficient to overcome the weight of the bucket valves so loaded with rubbish, and the column of water

in

in the stand pipes, the pump is hereby prevented from catching its water; the usual remedy for which is, to draw the bucket out of the working barrel, until a quantity of water has escaped by its sides, and displaced the air. Observe here, that this often happens from the unnecessary magnitude of the space between the bucket and clack.

Thirdly.—The pumps are suspended in the pit by capstan ropes, for the purpose of being readily lowered as the pit is sunk; the stretching of the ropes, (especially when sinking in soft strata,) occasions much trouble, by suffering the pumps to choke; but the most serious evil is, that the sinkers, in shifting the pumps from one place to another, throw them very far out of perpendicular, thereby causing immense friction, and wearing in all the parts; besides endangering the whole apparatus, by breaking the bolts and stays, and straining the joints.

Fourthly.—As the pumps sink, the delivering pipe at the top is raised, by putting on short pipes, generally about a yard at a time, which occasions many stoppages and much hinderance in the work.

Having an engine pit to sink at Codnor Park Colliery, Derbyshire, belonging to the Butterley Iron Company, I endeavoured to obviate the difficulties stated; and, first, for the purpose of preventing the pumps working too much upon air, I constructed a working barrel, (which in this case was nine inches diameter,) with a side pipe three inches diameter, connected therewith by an opening at the top and bottom; also at the upper end of the side pipe I fixed a valve, so as to slide over and shut the communication with the working barrel, the stem of the valve by which it is regulated, passing through a stuffing box, and by letting a quantity of water return through the side pipe, to the bottom of the working barrel, (the men at the bottom regulating the valve,

so

so that the pump takes the water as it comes,) very little rubbish is then taken into the pump, and much wear and tear of buckets prevented.

Secondly.—I also by this valve and side pipe, preclude the necessity of ever drawing the bucket to displace the air. The clack piece was made as small as possible, and the clack with its gearing very low, in order to have as little space as possible between the bucket and the clack. The clack as represented in the drawing, possesses the advantages of being easily caught by the clack hook, in case of being under water. The ring prevents it from oversetling, and thereby fastening itself in the pumps, and the valves are very easily repaired by unscrewing the cross-bar, which admits of their being taken off and replaced.

Thirdly.—I avoid the inconvenience of suspending the pumps by ropes, by forming the suction-pipe in two pieces, one inner and outer pipe, the outer pipe is bored for about six inches in length, and the inner one turned cylindrically to fit it; they slide into each other, the whole length of a regular pipe, viz. nine feet; and they are made tight by collars of leather, surrounded by a cup filled with water and clay. The pumps are supported at proper distances, so as to suit the length of the pipes by beams, and across those are other beams upon which the flenches of the pipes rest, these last are not fastened by any bolt, in order that they may be readily removed; the pumps by these means remain stationary, and the suction-pipe lengthens as the pit is sunk, until it is drawn out to its full extent. The whole column is then lowered to the next flanches, and another pipe is added to the top; the lower end of the suction pipe is formed some what like a crank, in order that the sinkers, by turning it round upon the other pipe, may move it from one place to another,

Mr. Wm. Brunton's Improved Pump for Mines.

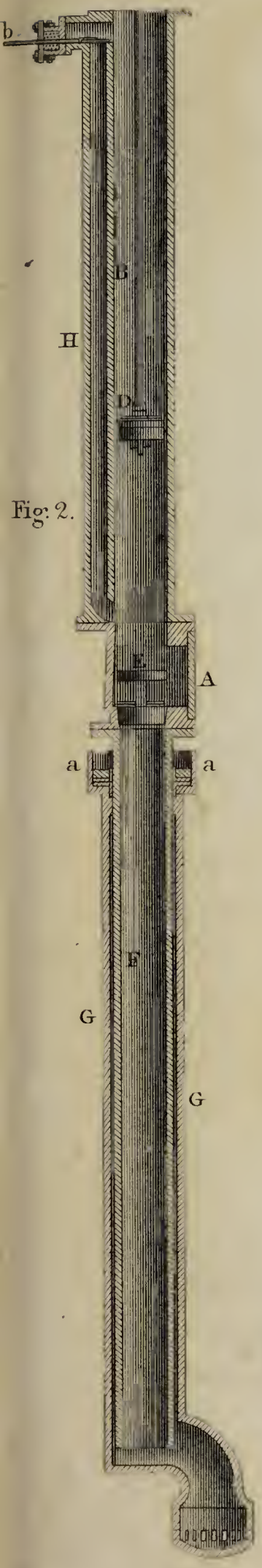


Fig: 2.

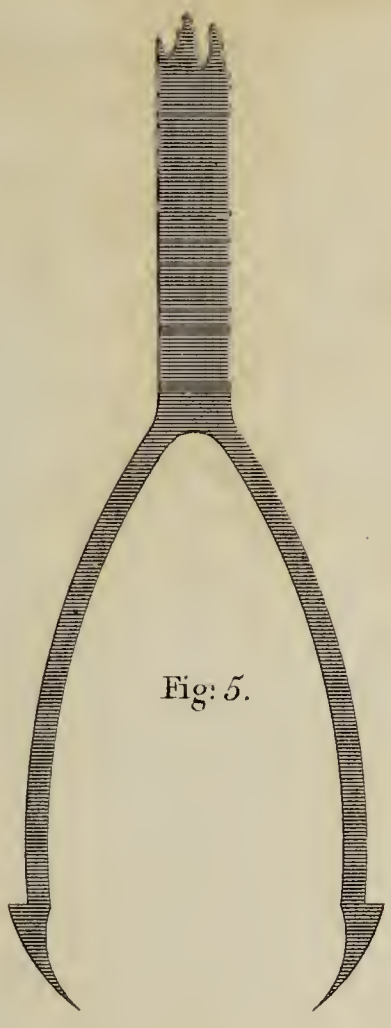


Fig: 5.

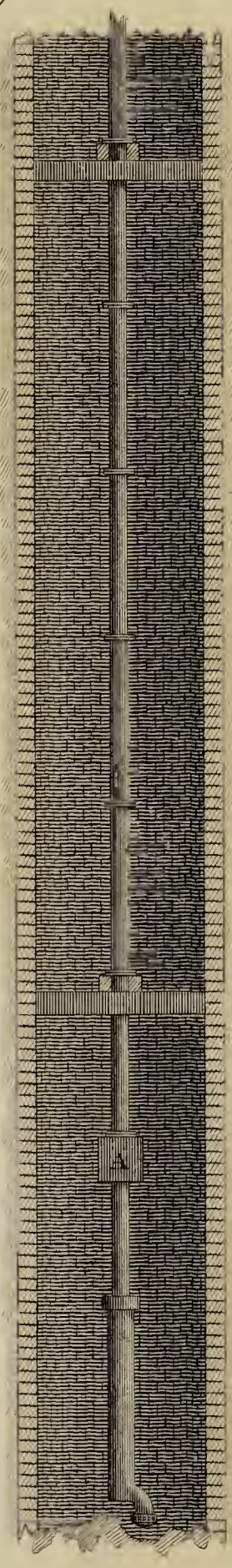
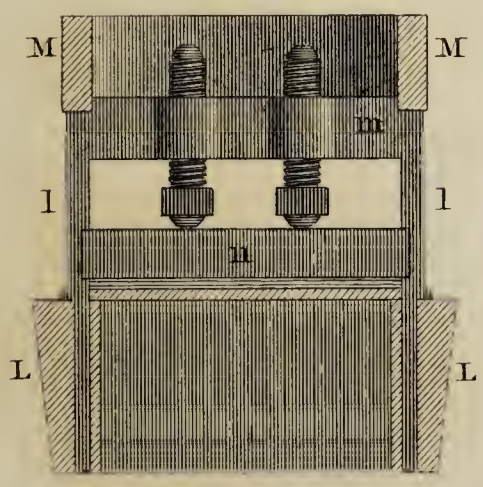


Fig: 1.

Fig: 3.



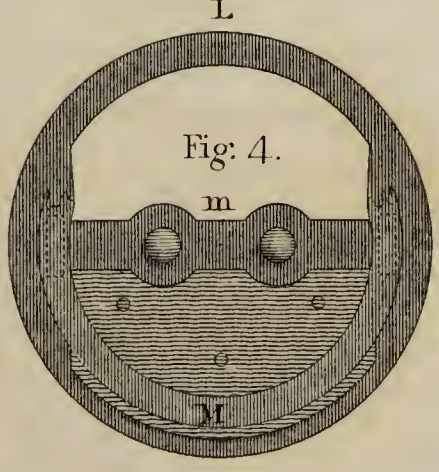


Fig: 4.

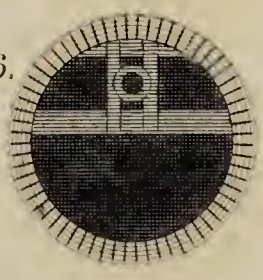


Fig: 6.

Drawn by J. Farey.

Engraved by S. Porter.

another, and so prevent the necessity of sinking immediately under it.

Fourthly.—The pumps being stationary as above-stated, the pipe at the top will of course deliver the water at the same level at all times, and instead of being obliged to lengthen the column every yard sunk, it will only be necessary every nine feet.

By sinking the pit above-mentioned in the manner I have stated, the whole of the difficulties so generally complained of were obviated, the safety of the workmen employed greatly increased, and much time, labour, and expence saved. If the above should appear to the Society deserving of their notice and patronage, or the publishing of it calculated for utility, they will thereby highly gratify and oblige,

Their most obedient humble servant,

W. BRUNTON,
Engineer.

Butterley Iron Works,
Derbyshire, October 20, 1810.

To C. Taylor, M. D. Sec.

Explanation of the Drawings of Mr. William Brunton's improved Pump, for Mining, and Sinking Shafts. Plate 5, Fig. 1, 2, 3, 4, 5, 6.

Fig. 1, is a section of a shaft or pit, with the pump fixed in it; it is cast in lengths of nine feet each, screwed together by flanches, and supported by beams extending across the pit, (as shown in the plan, fig. 6,) short pieces are laid across these,

these, with half circular holes in them, these being put round the pump, just beneath a flanch, sustain the pump firmly, but may quickly be removed when it is required to lower the pumps in the pit; and, as they are not fastened, they do not prevent the pumps being drawn upwards; A, fig. 1, is the door which unscrews, to get at the lower valve or clack of the pump; this is more clearly explained in the enlarged section, fig. 2, where A has the same designation, B, fig. 2, is the working barrel, with the bucket D, working in it; E is the clack, also shewn enlarged in figs. 3 and 4; F is the suction pipe, and G G, the moveable lengthening piece; this slides over and includes the other, as in fig. 2, when the pump is first fixed; but, as the pit is sunk, it slides down over the pipe F, to reach the bottom, as in fig. 1; the outside of the inner pipe F, is turned true and smooth, and the inside of the outer pipe G, at the upper end, is bored out to fit it; the junction is made perfect by leathers placed in the bottom of the cup, *a a*, which holds water and wet clay over them, to keep them wet and pliable, and consequently air-tight; the lower extremity of the suction pipe G, terminates in a nose, pierced with a number of small holes, that it may not take up the dirt; this nose is not placed in a line with the pipe, but curved to one side of it, so as to describe a circle when turned round; by this means the sinkers can always place the nose in the deepest part of the pit, as shewn in fig. 1; and when they dig or blast a deeper part, they turn the nose about into it, the sliding tube lengthening down to reach the bottom of it; by this means there is never a necessity to set a shot for blasting so near the pump foot, as to put it in any danger of being injured by the explosion, as is the case in the common pump; in which this danger can only be avoided by moving the

the pump foot to one side of the pit, which necessarily throws the whole column of pumps out of the perpendicular.

The construction of the clack is explained by figs. 3 and 4, the former being a section, and the latter a plan; L L is a cast-iron ring, fitting into a conical seat in the bottom of the chamber of the pump, as shewn in fig. 2; it has two stems *l l* rising from it, to support a second iron ring M M; just beneath this, a bar *m* extends across from one stem to another, and has two screws tapped through it, these press down a second cross-bar *n*, which presses the leather of the valves down upon the cross-bar of the ring L, and this holds it fast, forming the hinge on which the double valves open, without the necessity of making any holes through the leather as in common; but the chief advantage is, that by this means the clack can be repaired, and a new leather put in in far less time than at present, an object of the greatest importance; for, in many situations, the water gathers so fast in the pit, that if the clack fails and cannot be quickly repaired, the water rises above the clack-door, so as to prevent any access to it, and there is no remedy in the common pump but drawing up the whole pile of pumps, which is a most tedious and expensive operation; in Mr. Brunton's pump, the clack can at any time be drawn out of the pump, by first drawing out the bucket, and letting down an iron prong, fig. 5, which has hooks on the outsides of its two points; this when dropped down will fall into the ring M, and its prongs springing out, will catch the underside and hold it fast enough to draw it up; another part of Mr. Brunton's improvement consists in the addition of a pipe H, fig. 2, which is cast at the same time with the barrel, and communicates with it both at the top and at the bottom, just above the clack; at the upper end the pipe is covered by a flat sliding plate, which can be moved by a small rod *b*,

passing

passing through a collar of leather; the rod has a communication by a lever, so that the valve can be opened or shut, by the men in the bottom of the pit; the object of this side pipe is, to let down such a proportion of the water which the pump draws, as will prevent the pump drawing air; though of course the motion of the engine will be so adapted, as not to require a great proportion of the water to be thus returned through the side pipe; yet it will not be possible to work the engine so correctly, as not to draw some air without this contrivance; and if it does, it draws up much dirt and pieces of stone into the pump, besides causing the engine to work very irregularly, in consequence of partially loosing its load every time the air enters the pump. Another use of the side pipe is, to let down water into the chamber of the clack to fill it, when the engine is first set to work, after the pumps have been standing still, and the lower part of the barrel and chamber empty.

DEAR SIR,

A GENTLEMAN whose name is Brunton, a very ingenious mechanist, who was many years with Messrs. Bolton and Watt, and who has now the management of the machinery of our iron-works and coal-mines, and also of a steam-engine manufactory established here, informs me, that last October, in your absence, he left at your house a drawing of a contrivance for facilitating the sinking of deep pits in coal works, or other mines, which are incommoded by water, which is, more or less, always the case.

The common practice is, by beginning with a short length of

of pump-trees, and adding to them at the bottom as the pit deepens, and particularly toward the termination of the work; it becomes a very difficult and hazardous operation, and causes a great loss of time and expence.

Mr. Brunton's contrivance to get rid of this operation, is to fix the pumps permanently as they descend, except the bottom length of pipe, which is to be turned true on the outside; and there is connected with it a similar length of pipe, bored true, so as to slide upon the other like a tube of a telescope, and it will lower inch by inch, as the depth increases; a still further improvement is, to join to the last mentioned pipe, a short length with an elbow, so that after deepening a hole near the foot of the pump, the elbow turning in the segment of a circle, suffers the loose parts of the pump to drop gradually, till it require an additional length to the permanent or fixed part of the pump-trees, which is performed in less than ten minutes, and the loose part being in the mean time slid up to its place, is again ready for proceeding with another nine feet in depth.

If you have the drawing with its explanation, it would be unnecessary to add more than to observe, that any gentleman of the Society, at all conversant with mining, will in a moment see what we have proved by the actual use of it, that, simple as it is, it will be an acquisition of considerable value to those that are interested in mining. I trust you will think it worth the notice of the Society.

I am, Sir,

Your most obedient Servant,

W. JESSOP.

Butterley Iron Works, Derbyshire,
Dec. 3d, 1810.

To C. Taylor, M. D. Sec.

The SILVER MEDAL *and* TWENTY GUINEAS, *were this Session voted to Mr.* J. ALLAN, *Blewitts Buildings, Fetter Lane, for a Reflecting Circle, in which the Screens can be readily shifted in taking Altitudes. The following Communication was received from him, an Explanatory Engraving is annexed, and one of these Instruments is preserved in the Society's Repository.*

SIR,

I BEG leave to inform you, that on Thursday last, I left at the Society's house, a mathematical instrument, adapted for the use of mariners, which I wish to submit to the Society's attention. It is a Reflecting Circle, commonly called La Borda's Circle, for the purpose of taking altitudes and distances at sea; and which I have greatly improved lately, by fixing the shade glasses different to what had heretofore been done, with some other improvements as a Reflecting Circle. The late Dr. Mackay, in a publication of his, called Mackay's Longitude, has a plate of La Borda's original instrument, but the shade glasses are so fixed, as to render the instrument useless, and which he was convinced of on my pointing out to him the fault; he said he would alter his plate to my method, and that he would state it as my improvement; but his death soon afterwards prevented it. I am aware the Society do not confer their rewards without advantageous qualities to merit their sanction. I respectfully say, that I consider my instrument to have merit, both in œconomy, and in the great improvement made on the

the plan of the Reflecting Circle first invented. I shall be happy to point out this to the Society, and have the honour to be,

Sir,

Your humble Servant,

JAMES ALLAN.

Blewitts Buildings, Fetter Lane,
Dec. 24th, 1810.

To C. TAYLOR, M. D. SEC.

SIR,

AGREEABLY to the intimations of the Committee on Thursday evening last, I beg leave to explain to the Society, the properties of my improved Reflecting Circle; and which, with a Theodolite attached to it, would be useful both to the mariner and surveyor.

The Committee inquired what sort of center or axis the instrument had. I beg leave to state, it is an improved one of mine. The former way of centering this instrument, was only by a single pin, which both indexes acted upon; but the pin had so little bearing in the index, that it was not sufficient to keep the index-glass upright to the plane of the instrument in all its positions; I have therefore contrived to put what is called in our business, a male and female centre or axis, upon a simple but accurate method.

Permit me to make a few observations on circular instruments in general. I believe it will be universally allowed, that it is easier to make a circle nearer to truth, with respect

to its horizontal plane, than it is to make a separate part of a circle so.

A sextant is only the sixth part of a circle, and is got flat by means of a plane, as near as the maker can get it, but is not turned on its own axis as a circle is; therefore I have no doubt, but that the best sextant usually made, is very short of the horizontal truth of a sixth part of a circle; and if we were to suppose a circle made of six of the usual sextants, it would be a very untrue circle with respect to its horizontal plane.

It has, therefore, been a general desideratum, that a circular instrument of reflection should be introduced, of simple construction, easy to adjust, and convenient for use. I have been induced to make several circular instruments of reflection in various ways, but none upon so simple a construction, or so cheap, as the present, nor so well calculated to prove any untruth, as my improvement upon Borda's; and I believe it will now be generally adopted for use.

There have been great numbers of Borda's circles made; I myself assisted about twenty-five years ago to make many, also since I have been in business for the last twelve years on my own account, but I never found any of them to give satisfaction till I invented the present improvement.

Captain M'Lennan, who traded to South America, had one of Borda's Circles made, similar to that described in Dr. Mackay's Longitude, but could not use it till altered by me last April.

The glasses in my instrument are moveable to any quarter that a person may wish to use it in; and by taking the same angle with each quarter, it affords an opportunity of proving the correctness of the instrument, which circumstance I hope justifies me in saying, that it is the only instrument of reflection that I know, so well calculated to prove itself.

I beg

Mr. I. Allan's Improvement on the Reflecting Circle invented by Le. Borda.

Fig: 2.

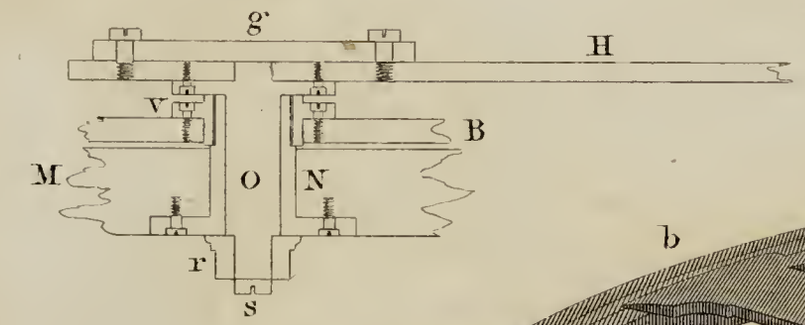
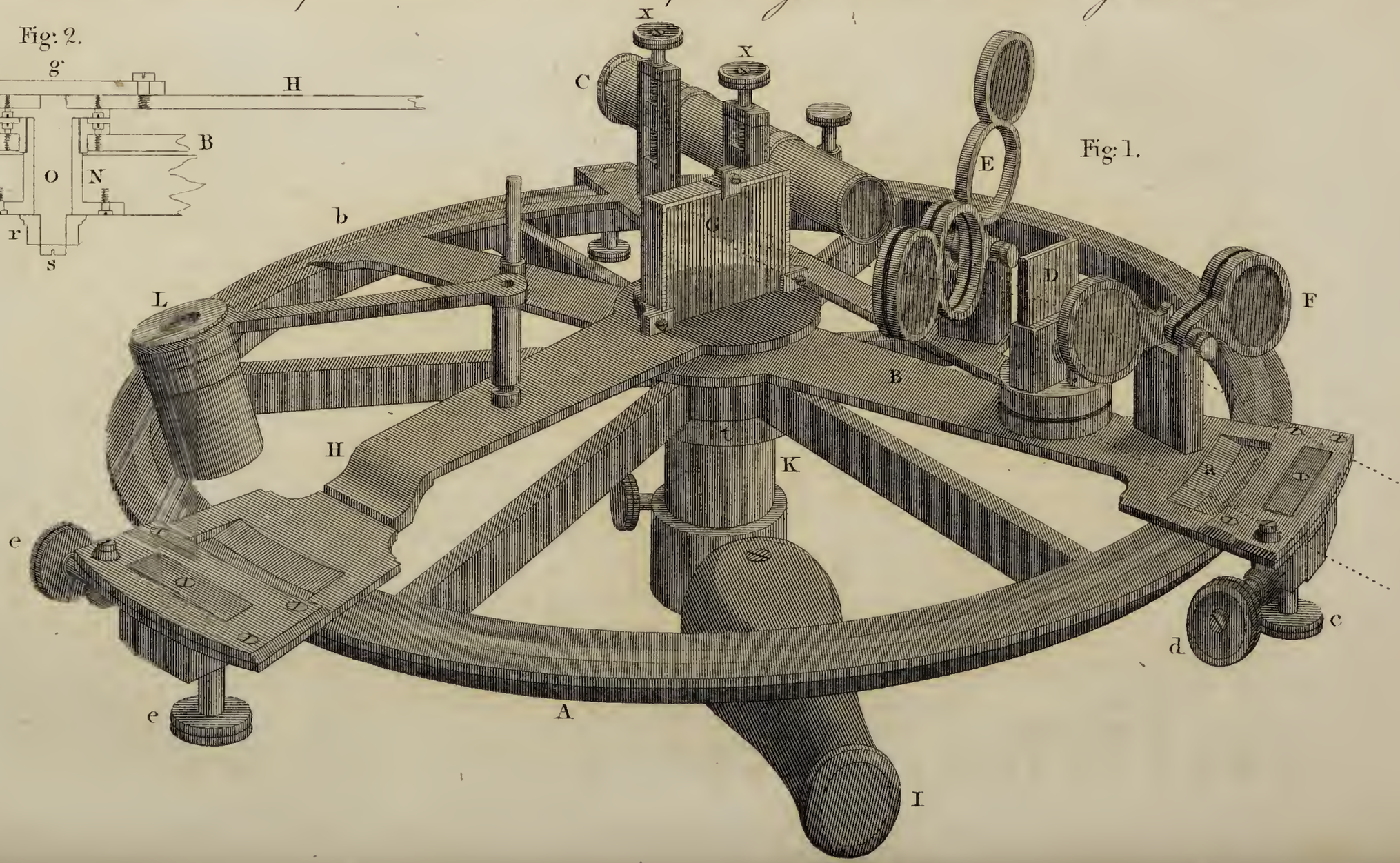


Fig: 1.



Drawn by J. Farey.

I beg pardon for being so tedious; I assure you that I can make the instrument better than I can write or talk about it.

I have the honour to be,

Sir,

Your humble servant,

JAMES ALLAN.

Blewitts Buildings, Jan. 16th,
1811.

To C. Taylor, M. D. Sec.

Certificates.

A Certificate was produced from Captain H. C. Coxen, R. N., dated Feb. 5th, 1811, stating his opinion, that the dark screens which are fixed to Mr. Allan's Reflecting Circle, so as to act in the manner they do in a sextant, are improvements on the Reflecting Circle of Mr. Borda, which are not so fixed.

That it must be evident, even to the least experienced mariner, that there are frequent occasions, in taking the altitude of the sun, to change the screens *alternately*, in the shortest possible time, which cannot be effected in near so short a time by screens which take off and on, as in Borda's reflecting circle.

Captain Mackay, who has commanded the Lord Forbes, in the Jamaica Trade, for twenty years, stated, that the manner in which Mr. Allan's screens are fixed in his Reflecting Circle, is a great improvement. That from not being obliged to take out the shades when the sun is

clouded, the object is not lost; and that when an instrument is obliged to be taken from the eye, to fix the screen in the old mode, the object is lost.

That by this instrument being a Reflecting Circle, it makes sure of a horizontal plane well divided, which can hardly be the case in a portion only of a circle.

That Mr. Allan's is the most complete instrument he has ever seen, and that he shall always take one with him to sea.

Description of the Drawing of Mr. James Allan's Improvement, on the Reflecting Circle of Borda. Pl. 6.

The Reflecting Circle, first invented by Tobias Mayer of Gottingen, and afterwards improved by the Chevalier La Borda, of Paris, is an instrument, which in its principle admits of such a degree of accuracy, as to be of the most important service to navigators; but it has hitherto been constructed in such a manner, that the inconveniences attending the use of it, have prevented its general adoption among seamen; any contrivances, therefore, tending to diminish these inconveniences, were deserving of the Society's notice. The construction of Borda's circle as they have hitherto been made, is minutely detailed in Dr. Rees's New Cyclopædia, article, Circle; and the mode of using it is there explained; it will be therefore unnecessary to describe any thing more of the circle delineated in pl. 6, than is essential to the elucidation of the improvements made by Mr. Allan.

The first of these is in the mode of applying the dark glasses,

glasses, which are fixed on joints, so as to turn back out of the way, in the same manner as in the sextant; in the old instrument these glasses were fitted into sockets provided with tenants on the indexes, and fastened by a milled head screw, which took much time to change them; the second is the addition of double verniers to the index, carrying the telescope and horizon glass; these read upon opposite sides of the circle, and if a difference is observed between these readings by taking the mean of them, the error arising from any ex-centricity the index may have, will be corrected; and the third consists in fixing the index glass upon an axis, accurately fitted into the centre of the circle; by this means it is assured that the index glass in turning round, shall always be exactly perpendicular to the plane of the circle; in the old method, when the index-bar was merely fitted on a pin fixed in the center of the circle, it was impossible to make the circle so perfectly flat, or keep the index so accurately in contact with it, as by having an axis. To explain these improvements more perfectly, the reader is referred to plate 6, which contains a perspective view of the instrument; A, is the circle with six arms; B, is the index carrying the telescope C, and the horizon-glass D, with the two clusters of dark glasses E and F; at the opposite ends of this index are the two verniers *a* and *b*, the former has the clamp screw and slow movement attached to it, consisting of a screw *c*, which fixed the index to the circle; and *d* is the tangent screw, which will move the index a small quantity when turned, to adjust it accurately; G is the index mirror screwed upon the index H, which has also a vernier, and a clamp and tangent screw *e e*, similar to the other; I is the handle by which the instrument is held when in use; it is fitted to a socket K, which is screwed to the center of the circle, and is unscrewed from the circle when packed

away; the handle is fitted to a springing socket, so as to turn round upon the socket K, that it may be turned to any side of the circle for the convenience of holding it; it may be fastened by a small milled nut, seen in the figure which binds the ends of the spring socket together; L, is a magnifying glass for the purpose of reading the divisions of the verniers; it is fitted upon a pin screwed into the indexes, and may be applied to either. The figure 2 in the corner of the plate is a section, shewing the construction of the central part of the circle, where M is a section of the thickness of the circle with a hole through the center, and a recess turned out in the lower side to receive a center piece N, which is fixed in with three small screws; a hole is turned in the center of this piece, and an axis O is fitted into it with the utmost accuracy, this axis has a flanch on the upper end by which it is screwed to the index H, and upon this, the under glass G, fig. 1, is fastened, by other screws passing through a piece projecting from the back of it; the axis is held in its place by a collet *r*, fitted on a square part of it, and held fast by a screw *s*; beneath this a piece is fixed on in the center of the circle, the edge of its flanch being shewn by *t* in fig. 1, it is part of the screw which holds on the spring-socket K, for the handle I, the upper end of the center piece N which comes up above the circle, is turned extremely true, and upon this the index B is fitted, or rather a brass ring *v* screwed to it, so as to turn round upon it as a center.

The telescope C, is fixed to the index by two cocks and by two screws *x x*, in these it can be raised up or lowered, to adjust the different brightness of the two objects seen in the horizon-glass D, the one reflected from the central mirror G, and the other seen directly through it; the dark glasses at E, are intended to moderate the light of the sun, in passing from the index to the horizon-glasses; the frames containing

containing these glasses have holes E through them, to see through the telescope and horizon-glass, the other dark glasses F, are situated behind the horizon-glass D, and may be turned up or down as occasion requires.

The instrument is used in the same manner as the common Reflecting Circle; the angle being first taken on one side of the parallelism of the glasses, and then on the other; so that the angle is doubled, then it is repeated on a fresh part of the circle, as many times as the observer thinks proper, and the product divided by the number of observations taken; the mode of taking these observations is explained at full in Dr. Rees's Cyclopædia, and in Dr. Mackay's publication on the means of finding the longitude.

The SILVER MEDAL *of the Society was this Session voted to Mr.* JOHN HODGSON, *Charles Street, St. James's Square, for a Method of Correcting the Variations of the Mariner's Compass. The following Communication was received from him, an Explanatory Engraving is annexed, and the Instrument preserved in the Society's Repository.*

SIR,

I TAKE the liberty of requesting you, to submit to the Society for the Encouragement of Arts, Manufactures and Commerce, a small Theodolite, to which an addition has been made, calculated, it is hoped, to be of some utility.

The

The frequent recurrence to the variation of the compass, which is necessary in the use of the Theodolite, is always attended with trouble, and not unfrequently productive of error.

It appears to me, that by a very simple expedient, these inconveniences may in a great measure be removed. To the magnetic needle of the instrument, let one of brass be affixed moveable upon the center of the former; the brass needle may be termed the corrector. Nothing more is necessary than to place the magnetic needle and the corrector, at the angle of the variation, in such a manner that the former being in the magnetic meridian, the latter shall be in the true meridian. The south end of the corrector will point to the true bearing of an object, seen through the sights of the Theodolite.

I also beg to lay before the committee a ship's compass, in which will be found a different application of the same principle. In this instrument, the needle is made moveable under the compass card, so as to be placed by the officer of the watch, or any other proper person, under the variation line, as often as an azimuth or an amplitude shall have been taken. The points of the compass will, by these means, be directed to their corresponding points in the heavens, and the mariner will know that he is really sailing upon the rhumb indicated by the cord.

I am inclined to think that a seaman may sometimes be liable to error, in the continual reference which it is necessary for him to make to the variation of the compass, from a possibility of his allowing it on the wrong side, by substracting where he should add, or by adding where he should substract it; even under a supposition that such a mistake is not likely to occur, the use of this instrument as an additional check, in a matter of so much importance as is the ascertaining

taining of a ship's course, may not be entirely unworthy of attention.

It is very probable, that from my imperfect information upon these subjects, I am now proposing what has before been suggested, and been found either to be wholly impracticable, or of little or no utility when reduced to practice. This is indeed the more probable from the extreme simplicity of the expedient itself, which could scarcely have escaped the attention of the many enlightened seamen, and others, who have devoted their minds to subjects of this nature. This consideration, however, is not sufficient to induce me to lose a chance of suggesting any, the most trifling hint, which may be useful to a class of men, to whom we are so much indebted.

It may be objected against the application of this principle to a ship's compass, that as the variation in a long voyage is continually changing, the card in a short time after it has been adjusted, will not point truly. This must be admitted, but it must also be recollected that it will agree with the last variation ascertained, and which is that on which the mariner must rely, until a fresh observation shall have been taken.

It may also be objected, that through the negligence of the persons employed to regulate this instrument, errors may arise, equal to those which it is intended to obviate; but surely, whatever may tend to afford a correct knowledge of a ship's course, is of sufficient importance to render the adjustment of the card an office by no means unworthy of the Captain himself; and it cannot be supposed that he, or indeed any other officer, can be liable to error in an operation merely manual.

If we admit, however, that these objections are well founded, an instrument of this description might not be destitute of utility, placed in the Captain's cabin, or some other

other convenient part of the ship, where it might continually indicate her course, without the necessity of a reference to the last observation; and at the same time serve as a check upon the several courses entered from the steering-compass.

Whatever obstacles may exist to the application of this contrivance to the ship's compass, I apprehend that there will be none to its utility, as applied to the instruments used in land surveying; confined as that business is to tracts of country, within which only a trifling annual variation takes place, and to which variation the corrector may be set whenever it becomes considerable.

To the common boat and pocket-compass, the same principle may be applied with equal utility; to the latter especially, which may frequently, perhaps, be in the hands of persons unacquainted with either the bearing or amount of the variation of the magnetic needle.

As the instruments submitted to the Committee are merely intended for illustration, I have not aimed at great nicety in their mechanism. It is obvious that they are capable of considerable improvement, and that both the Theodolite, and the ship's compass, may be so constructed, as to be capable of all requisite accuracy in their adjustment, without loading them in such a manner as to obstruct the free motion of the needle.

If a modification of these instruments, in itself so simple, shall be found to be of the least utility, I shall feel highly gratified.

I am, Sir,

Your very obedient servant,

JOHN HODGSON.

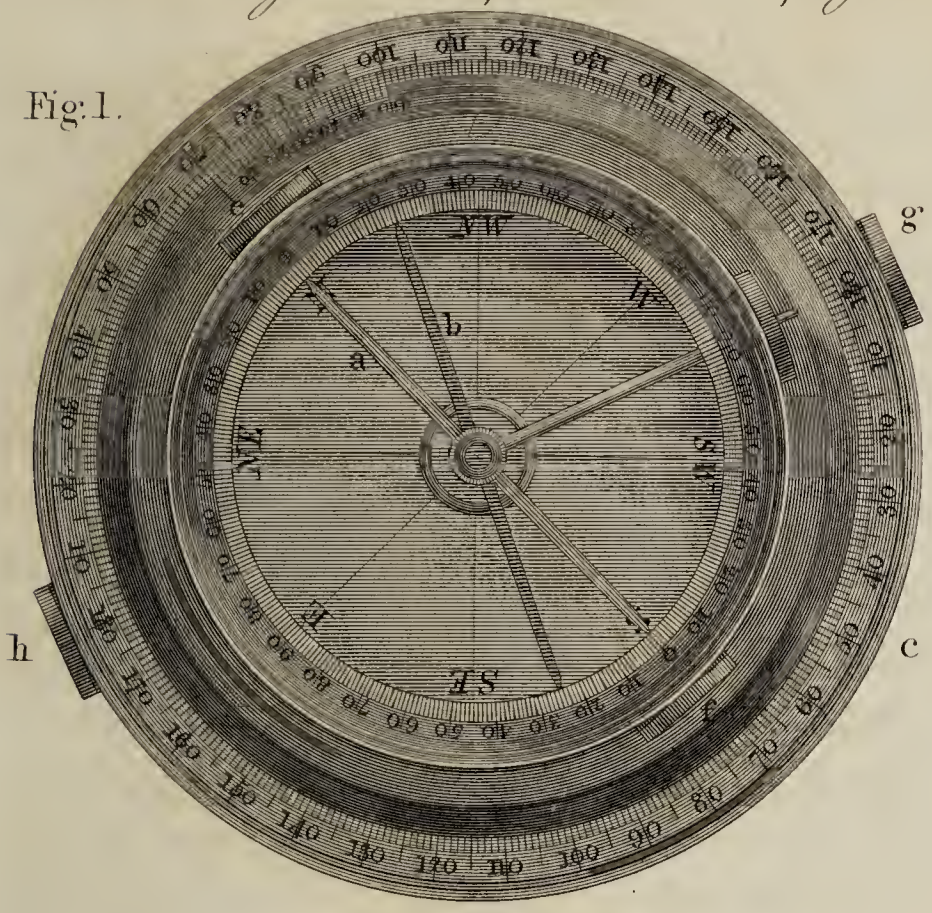
Charles Street, St. James's Square,
April 23d, 1811.

To C. Taylor, M. D. Sec.

Reference

Mr. Hodgson's Improved Compass.

Fig: 1.



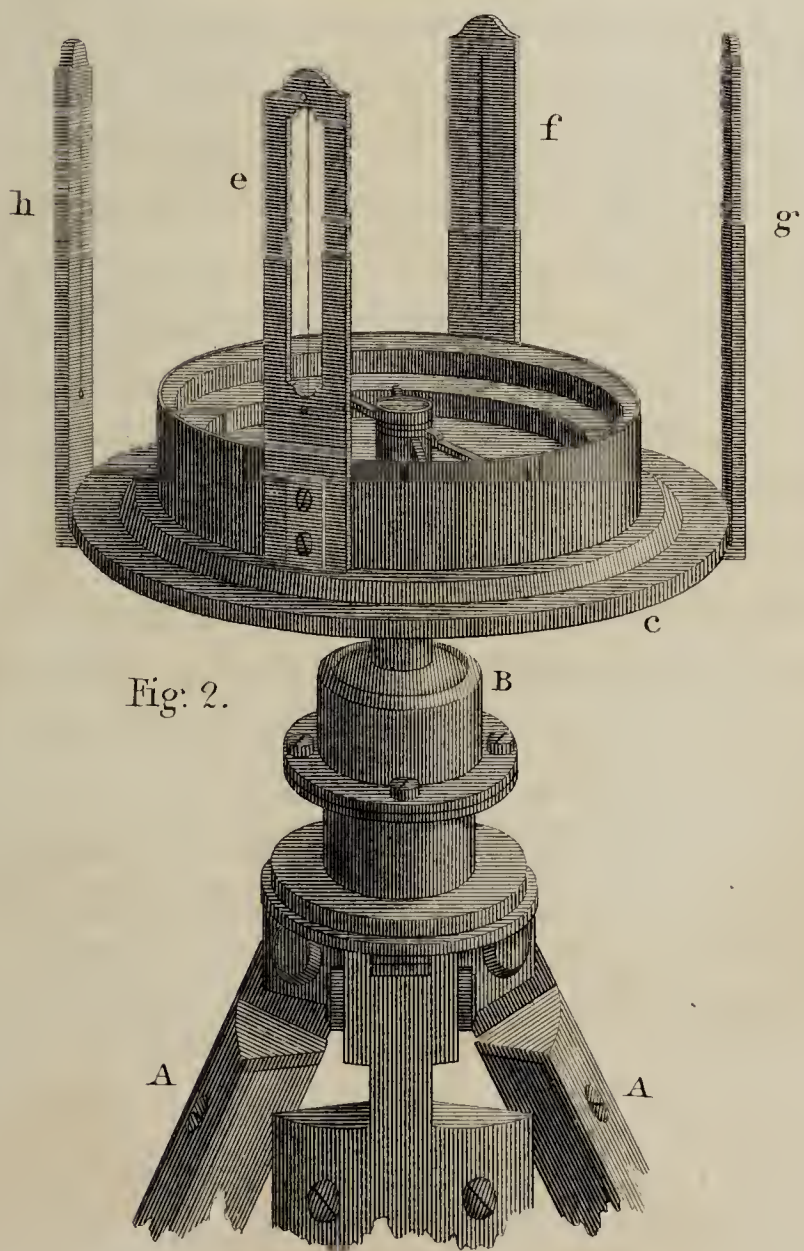


Fig: 2.

Reference to the Drawing of Mr. John Hodgson's Variation Compass. Plate 7, Fig. 1 *and* 2.

THE two figures in this plate are, a plan and perspective view of a small theodolite or circumferentor, for taking horizontal angles by the magnetic needle; it is to the latter alone that Mr. Hodgson's improvement applies; being a brass needle *a*, fig. 1, which is fitted upon the brass center piece, or cap, of the real needle *b*, in such a manner that it can be easily turned round to make any angle with the needle, and having sufficient friction to remain where it is placed; both needles are poised on the same center point, with an agate cap in the usual manner, the brass needle being only an index to point out the divisions on the circle within the compass; this index being set so as to make the same angle with the needle, as the difference of the true and magnetic meridians, will at all times give the true bearings of any object observed through the two sights *e* and *f*, which are diametrically opposite, and at the zero of the divided circle; at least whilst the variation of the needle continues the same; but as this alters by the instrument being used in a different tract of country, the brass index *a* must be turned round a corresponding number of degrees which are shewn by the divided circle in the box. The remaining parts, shewn in fig. 2, are A A, the upper ends of the tripod supporting the instrument; B the ball and socket by which the box is adjusted, so as to be horizontal; the stem of the ball has a circle *c* fixed to it, carrying two sights *g h*, through which the observations are taken; the circle *c* is divided into degrees, and the compass-box, which turns round upon it, has a vernier applying to them; this renders the instrument a theodolite, as any two objects may

be

be observed through the sights *e f*, and *g h*, and the divisions on the circle *c*, will denote the angle between them, and at the same time the bearing of any object may be taken by observing it through the sights *e f*, and noting the degree pointed out by the brass needle *a*, which is the true bearing required, without any allowance for the variation, as was the case in the common instrument.

The SILVER MEDAL *of the Society was this Session voted to* HENRY EARLE, *Esq. of Hanover Square, for an improved Bed for Persons whose Limbs are fractured, or who are sick and infirm. The following Communication was received from him, an Explanatory Engraving is annexed; a Model of the Bed is preserved in the Society's Repository, and the Letter, or Printed Tract, alluded to, is placed in the Society's Library.*

SIR,

THE well-known zeal which your most useful and excellent Society has ever evinced, in whatever concerns the public good, has induced me to send the model which will accompany this, for their inspection. It consists of a double bed, for the relief of such persons as from accidents or disease, are rendered incapable of moving, when it is necessary to obey the dictates of nature. The first was constructed about four years since, after having seen a poor fellow, who had broken

broken both thighs and his left arm, and who, in consequence of the impossibility of being moved, was in a state almost too dreadful to describe, from the accumulation of fæces and maggots. I cannot here omit expressing my surprize, that so material a consideration as this should have been so long neglected, particularly as in many cases it really appears almost indispensably necessary. I have since that time had frequent opportunities of witnessing the very great comfort and ease which this contrivance has afforded, both to patients and their attendants. I feel it a duty incumbent on me, to render public an invention which is of such great consequence to Society at large. It arose from my finding the absolute necessity for such a contrivance. In its construction, simplicity and utility have been my study; the comfort and relief of persons in a most helpless and distressing situation, have been my object. I am aware, that the true value of such an invention can only be estimated by medical men, who have witnessed the mortifications, and even fatal effects, which arise from a want of cleanliness in this particular, and by such persons as have themselves been subject to the miseries which I have described. By means of this contrivance, patients in the very worst state may enjoy all the luxuries of cleanliness and ventilation. There is another object which the same contrivance has been made to answer, which is of nearly equal importance with the one just mentioned. It frequently happens, that it is necessary to raise patients to dress wounds on the back, and to place fresh linen under them. This cannot be accomplished where there is any fracture without great difficulty, and requires a number of assistants, who become weary before the dressings, &c. are ready. The present contrivance is eminently adapted to remove this difficulty; by it, the patient may be raised from the bed for

any

any length of time, without the least inconvenience or derangement of the fractures. The first person I tried this on, was a stout drayman, a patient of Sir Charles Blicke's, who had a compound fracture of both legs; this man was almost daily raised to have an ulcer on his back dressed, without experiencing any pain, and the broken bones remaining undisturbed. I believe I may very fairly attribute the well-doing of this case, in a great measure, to the perfect quietude in which the limbs were preserved. Another great advantage in this contrivance is, that it may be entirely managed by a single person. I have also made the frame of the upper bed rise at either end, independent of the opposite one. This may sometimes be useful, but is not to be considered as a very material object. The beds which were made for the use of St. Bartholomew's Hospital were compleat, both upper and lower bedstead. I have since managed, that the apparatus may with ease be fitted to any bed, at an inconsiderable expence, in order to adapt it to more general use. I will not intrude any longer on your valuable time, by a detail of the particular cases to which this bedstead is applicable; suffice it to say, that in all cases where perfect quietude of the body and lower extremities is necessary, this contrivance will be found of infinite service. If any further account is required, I shall beg to refer you to a letter which my father published some time since, on fractures of the lower extremities, in which this bed is fully described. I have taken the liberty to send one of these letters, of which I beg your acceptance, and remain,

Sir,

Your obedient humble servant,

HENRY EARLE.

Hanover-square, December 19, 1810.

To C. Taylor, M. D. Sec.

Dear

DEAR SIR,

THE model which I had the honour of presenting to the Society at its last meeting, being imperfect, I have taken the liberty of sending another, which will, I hope be found more complete, and is much less complex and expensive. I should feel myself obliged if you would explain, when it is next taken into consideration, that the first model was not intended as a correct representation of what I meant the real bedstead to be. It was only the principle which I was then desirous of submitting to the inspection of the Committee; the one which will accompany this is a precise model of the apparatus, which I propose to be manufactured for the future.

The principal difference consists in its capability of being adapted to any bedstead, without putting a single screw into, or otherwise damaging such bedstead. The frame is also kept perfectly steady, and when it is necessary to raise the rack, independent of the frame, it is effected in a much more simple manner. I subjoin to this an account of the frame, &c., though it will be much better understood by a view of the model, than any verbal description.

I remain, with great respect,

Dear Sir,

Your obedient servant.

HENRY EARLE.

Hanover Square, January 9, 1811.

To C. TAYLOR, M. D. SEC.

Mr. Earle's Description of his Apparatus.

THE apparatus consists in a frame of wood, of the length of a common bed, and about three feet six inches or four feet wide. Across this frame a strong ticking is strained, and fastened by buckles and straps, as in the model, or it may be corded like a common bed. In the centre of this ticking an aperture is made, of about four inches in diameter. This opening is closed when not used by a stripe of ticking, which passes across the frame, and is buckled to the opposite side. This frame is to be placed on the featherbed, mattress, &c. of a common bed, and covered with a blanket and sheet doubled, and placed above, and another below the aperture, or a hole may be cut in the blanket and sheet.

The frame is raised by two racks, which pass through mortices at its top and bottom; the frame is connected to the racks by chains, which proceed from its corners to the top of the racks, and which hook on to any height that may be required. The racks are worked in boxes by a wheel and pinion; a long spindle connects the two pinions, by which one handle raises the two ends at once; this spindle runs under the frame of the under bedstead. Each box containing the wheels is fixed to the rail of the under bedstead by two strong flat staples, which are fastened to the back of the box. When the patient is to be raised, independent of the frame a cross-bar of iron is fitted to the top of the racks; broad girths are to be passed under different parts of his body, and connected to this bar, the chains are to be undone, and the handle turned round, when the frame being no longer connected with the racks will remain stationary, whilst the patient is gradually raised and suspended from the bar.

When it is desirable to raise one end of the frame higher than

than the other, it is accomplished by unhooking the chains from the opposite end to that which is to be elevated. In all these motions the descent of the rack is prevented by a a stop, which is passed between two of its cogs.

The price of this apparatus, if made of cast iron, will I believe be under five pounds.

HENRY EARLE.

Letter and Certificates.

DEAR SIR,

I HAVE just learned that you intend presenting to the Society of Arts, &c. a model of your very ingenious bedstead. I hope I may not be too late in offering my testimony of its great utility, and the comfort and ease which it affords to invalids under a variety of circumstances.

The evident advantage of this construction induced the Governors of St. Bartholomew's Hospital, to order some to be made, which have been for many years in constant and improved use. In compound fractures of the leg especially, I have considered it as nearly indispensable, as almost all the duties requisite may be performed to the patient, without the danger of disturbing the limb, and for such cases I have principally used it in the hospital.

Sincerely hoping that you may have the gratification of seeing your benevolent invention adopted in general practice,

I remain, Dear Sir,

Your sincere friend and humble servant,

LEDFORD HARVEY.

St. Bartholomew's Hospital, Dec. 19, 1810.

To HENRY EARLE, ESQ.

A CERTIFICATE was received from SIR CHARLES BLICKE, of Bedford Place, dated December 19, 1810, stating that he had much pleasure in offering the opinion he entertained of Mr. Earle's double bed. That he had often witnessed and experienced in St. Bartholomew's Hospital its utility upon urgent occasions, arising from serious accidents, and also the great comforts it affords to the patients.

A Certificate was also received from THOMAS WHEELER, Esq. dated St. Bartholomew's Hospital, December 19, 1810, stating the agreeable sensation he had on observing, in St. Bartholomew's Hospital, the great comfort resulting from the use of Mr. Earle's double bedstead, to patients labouring under various infirmities. That the benefits and accommodations of it are so great, as to entitle his useful invention to the notice of the public.

A Certificate was also received from THOMAS RAMSDEN, Esq. dated College of Physicians, December 21, 1810, stating, that he had seen the double bedstead which Mr. Henry Earle had submitted to the Society of Arts, &c. applied to the accommodation of patients under injuries to their limbs, which would have rendered it quite impossible for them to have been removed for the purpose of cleanliness, by any other means; and that he therefore thinks highly of its utility.

Reference to the Engraving of Mr. Henry Earle's Bedstead for Invalids. Plate 8, Fig. 1.

A B are the side rails, C the head, and D the foot rails of a common bedstead, to which an elevating frame is adapted

Mr. H. Y. Earle's Bedstead for Invalids.

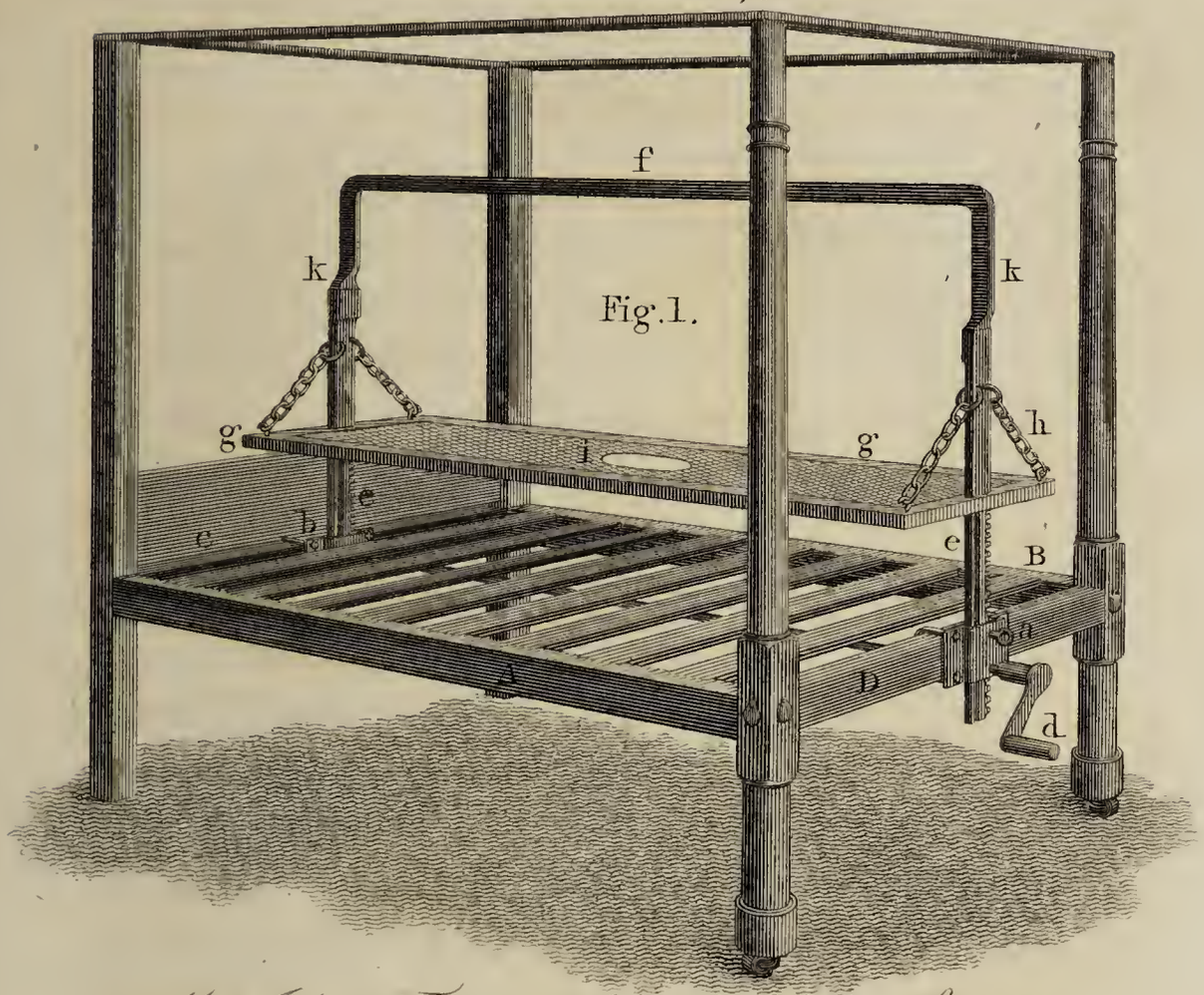


Fig. 1.

Mr. John Fuller's Improved Scarificator.

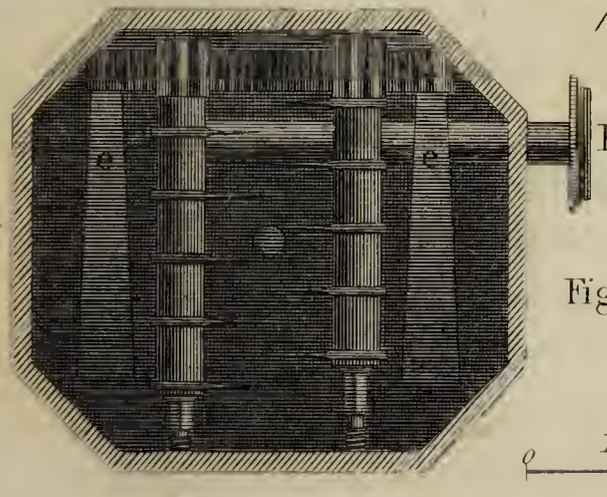


Fig. 2.

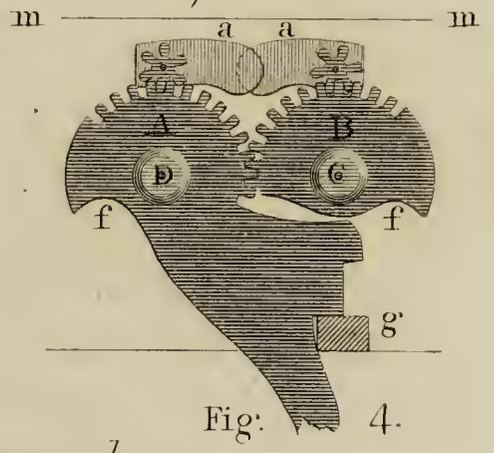


Fig. 4.

1 Inch.

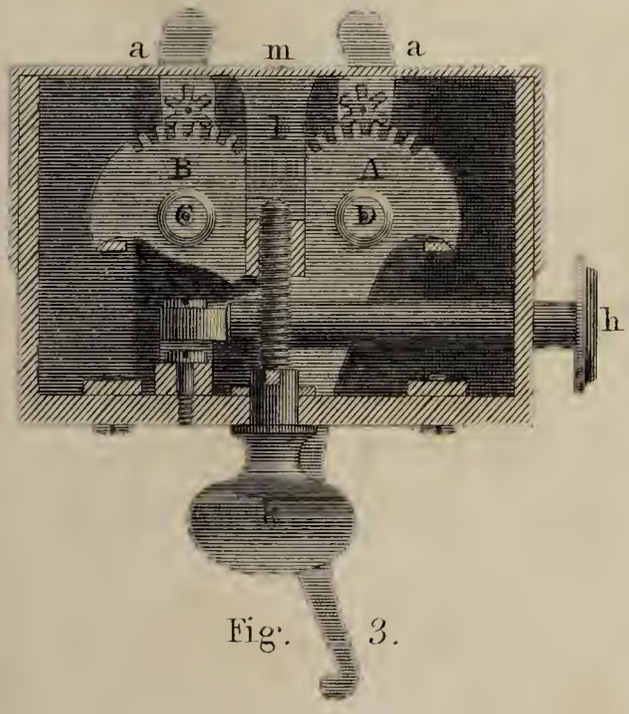


Fig. 3.

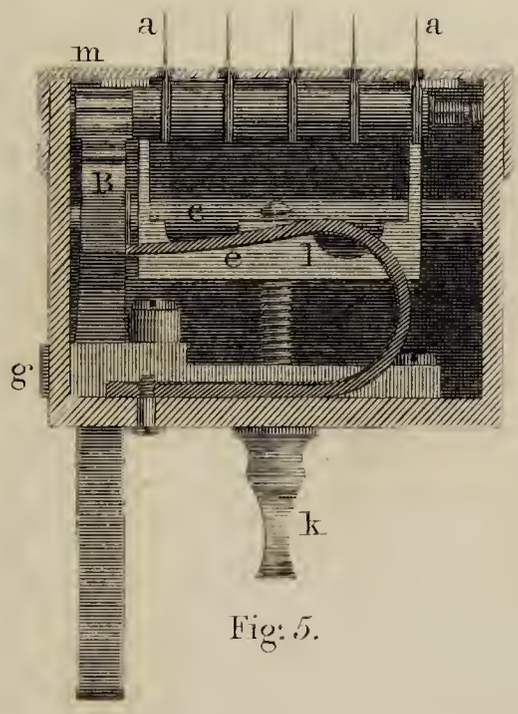


Fig. 5.

Drawn by J. Barey.

Engraved by S. Porter.

adapted in tht following manner: Two small iron frames or boxes *a b*, are fastened to the head and foot rails, by a pair of iron staples fixed to each, which encompass the rails, and by nuts screwed upon the ends of the staples; the boxes are thus firmly fixed to the rails, without making any hole in them; each of these boxes contains a pinion connected together by means of an iron axis, extended from one to the other, so that both are turned at the same time by the handle *d*, and elevate their respective racks, *e e*, from which the frame *g g*, is suspended by the chains *h*; the frame *g g* is made of wood, about four feet wide, and of the same length as the bedstead frame; and the racks pass through mortices made in the end rails of it, so that unless the chains are hooked on, the racks rise and fall independent of it; this gives an opportunity, if the case of the patient requires it, of inclining the frame upwards, by detaching the chains at the feet, and raising up the racks; the head one, which has the chains hooked on, raises up the head of the frame, leaving the feet resting on the bedstead; the racks may be secured at any elevation, by pins put through holes in the boxes *a* or *b*, which then catch between their teeth, and prevent them being moved until the pin is withdrawn; *f* is an iron bar or rod extending from one rack to the other, this bar is used to elevate the patient independent of the frame *g g*; when this is used, the chains are unhooked, and linen bands are passed under the invalid, who is supposed to be lying upon the frame, and the ends tied to the iron rod; then by turning the handle, he is elevated off the bed and frame, and may be suspended whilst the bed is made beneath, and then lowered down upon it without injury or much inconvenience. When the adjusting frame is used alone for elevating the patient, either for making the bed, or for introducing a bed-pan, &c. beneath the frame, the iron bar is removed; and for this

purpose it has tenants at its ends, which are dropped into sockets made in the tops of the racks at *k k*; *i* is an aperture in the ticking of the frame *g g*, through which the patient without being disturbed, may discharge his fæces or urine, when the frame is raised for that purpose, and a vessel placed under the aperture to receive them.

The SILVER MEDAL *was this Session voted to Mr.* JOHN FULLER, *No.* 14, *Hatton Garden, for an Improved Scarificator. The following Communication was received from him, an Explanatory Engraving is annexed, and one of the Implements is preserved in the Society's Repository.*

SIR,

I WISH to submit to the notice of the Society an improvement in the construction of the Scarificator, and which I flatter myself will be found worthy their attention. It may be necessary to premise, that the Scarificator is an instrument used in cupping for making the incisions, from which blood is afterwards obtained by means of exhausted glasses. As the degree of pain caused by this operation, depends on the good or bad quality of the Scarificator, this instrument has always been an object of attention. The best Scarificators generally in use propell from ten to sixteen lancets, through about half a circle, which is effected by a part, termed the rack, moving on its centre or part of its edge. On part of its edge are situated teeth, which are so confined that by moving the cock or tail of the rack, they work three pinions, and make them

them revolve about half a round: it is evident that lancets fixed on the axis of these pinions must also have a circular motion, and endeavour to cut any thing opposed to their passage; it is likewise evident that if a spring be so set that it can be released, and its force applied on a sudden to the rack, (somewhat similar to the main-spring of a gun-lock) all the lancets will be carried forward at once, and that with a force and velocity in proportion to the strength of the main-spring. The objections to this construction, and which frequently occur in practice are, that from the number of lancets necessarily used, the resistance to their motion is so great, that they do not move with the swiftness requisite to the ease of the patient; it is likewise often desirable to have the incisions rather deep, and then they are often quite stopped in their progress; besides this, by the lancets all moving one way, they are found to drive the skin up in folds, and thus present additional resistance, and occasion excessive pain to the patient; if to obviate these inconveniences the main-spring be made very strong, it is then, from its confined situation, exceeding liable to break, and if this does not happen, another inconvenience is produced, viz. from its very great strength it is scarce possible for any person to cock and discharge it with the requisite ease.

It was therefore suggested, that if two rows of lancets could be made to move in contrary directions, these, by keeping the skin equally stretched, would form clean incisions with much less force than in the former method: The Scarificator A, marked No. 1, was therefore constructed, and first used early in 1802; it is accompanied by its working model B; this instrument at the first contained the twelve long-edged spiral lancets C. This instrument immediately shewed its theory to be good, but it had its faults, the incisions were too long when of the necessary depth; from the complex nature

of the two racks, &c. and from the confined situation to which they were restricted, they could not be placed in the most favourable position for motion, and was therefore liable to be out of order; these and many other objections were altered or removed in various ways, which at length terminated in the construction of the instrument D, marked No. 2, also containing twelve lancets, combining every advantage and improvement suggested by experience and reflection. This instrument admits of two main springs, but from the manner in which the racks work in each other, and in their respective pinions, they in effect become one, but maintain the advantage of being made more slight, and consequently admitting a greater extent of motion than a single stiff spring can possibly accomplish; besides which they are not so liable to break; and should this happen to one, the instrument would not be useless, for I believe that one of these springs would be strong enough for all ordinary purposes, as incisions are effected with much less force when the lancets diverge, but combined they never have shewn the least disposition to stop, however deep it might be necessary to set them, or strong the integuments to which they were applied; and consequently attended with greater ease to the patient. On inspecting the instrument and working model E, its simplicity, I flatter myself, will be admitted; nor is any force of the mainsprings spent in overcoming unnecessary friction or ill-directed motion; the ease likewise with which the instrument is discharged, considering its strength of spring, will be noticed by every one accustomed to Scarificators. It may be objected to this instrument that it is larger and heavier than the ordinary Scarificator, but it is capable of being reduced without injury to the improvement, as is shewn by the instrument F, which is completely within the usual size.

I have

I have been favoured with testimonies of approbation from the following respectable gentlemen. Dr. Willan, physician; Mr. Armiger, Mr. Frampton, and Mr. Lawrence, Surgeons and teachers of anatomy.—It will be also seen that while in the possession of Mr. Armiger, it was approved by the late Dr. Rollo, and by Dr. Irwin, the present Surgeon-general and Inspector of Ordnance Hospitals; and I may add as a further proof of its utility, if more be necessary, that by an illiberal use of private confidence, others have been made on a similar plan, and I am misinformed if the honour of this invention has not been claimed, within these few months, by three or four different individuals.

Accompanying this is another Scarificator, G, the peculiarity of which consists in the lancet being projected directly forwards, and returning into the box or case; the washing model N is not exactly such as is contained in the instrument, but an improvement on it. This instrument and model must be considered merely as experiments, to see how such motion could be effected; for, persuading myself that punctured wounds would be more painful and more difficult to heal in this, as they usually are in other circumstances, compared with incised wounds; and likewise having so happily succeeded in constructing that already described, which I consider so far superior, I never used it, and therefore can say nothing as to its operative merits; nor should I have recalled it from oblivion, but having lately seen a description of a Scarificator by punctured wounds, invented by a very ingenious and respectable medical gentleman, who speaks very satisfactorily of its performance, and which does not possess the advantage of the lancet withdrawing from the wounds, but are removed with the instrument, I thought, that should mine be a mistaken opinion, and that some real advantage attends this method, it occurred to me that submitting the instrument to

the Society, would be applying it to its best use; as from its possessing the property of the lancets withdrawing themselves, it might suggest some ideas for further improvement.

I am, Sir,

Yours obediently,

JOHN FULLER.

No. 14, *Hatton Garden.*

To C. TAYLOR, M. D. SEC.

CERTIFICATES.

A CERTIFICATE was received from T. J. ARMIGER, Esq. dated Theatre of Anatomy, Bartletts-court, Holborn, February 20th, 1811, stating, that the manner in which the lancets make the incisions by diverging, is well calculated to extend the skin during the action of the instrument.

That being at Woolwich in July, 1807, he shewed Mr. Fuller's instrument to the late Dr. ROLLO, and to Dr. IRWIN, the present Surgeon-general and Inspector of Ordnance Hospitals, who both highly approved of it.

A Certificate from HEATHFIELD T. FRAMPTON, Esq. dated St. Mary Axe, February 26th, 1811, stating, that the principle upon which Mr. Fuller's Scarificator acts, appears to him a considerable improvement, not only upon those in general use, but also upon that constructed by Mr. Fuller many years ago, in which the lancets strike perpendicularly. That he thinks Mr. Fuller will do well to make the instrument publicly known, that it may be brought into general use.

A Certificate

A Certificate from WILLIAM LAWRENCE, Esq. dated Giltspur-street, March 22d, 1811, stating, that he has examined the Scarificator invented by Mr. Fuller; that the principle adopted in this instrument, of making the lancets diverge when they are discharged, seems to him to possess great advantages over that of the Scarificator in common use, and that the mechanism seems very well calculated to secure all the advantages which this principle can produce.

A Certificate from ROBERT WILLAN, M. D. dated Bloomsbury-square, March 6th, 1811, stating, that the new plan of a Scarificator, as constructed by Mr. Fuller, appears to him worthy of attention and encouragement, since it must diminish the inconveniences arising in, and after, the operation for which it is employed.

Description of the Engravings of Mr. John Fuller's Scarificator. Plate 8.

Figs. 2, 3, 4 and 5, are sections of this instrument, taken in different positions, to explain its interior mechanism; fig. 2, is a plan of the lancets, the top of the box being removed to shew them; fig. 3, is a section through the center of the box; and fig. 5, the same, but taken in the opposite direction.

The lancets *a a*, figs. 3, 4 and 5, are fixed upon two small arbors mounted parallel to each other, across the box; the lancets are so arranged on the arbors, that those upon one arbor are placed in the intervals between the lancets fixed upon the other; the arbors are placed near the top of the box, and the lancets act through clefts cut in the lid, (as shewn

shewn in figs. 3 and 5,) when the arbors are turned round; this is performed by a pinion upon each arbor, receiving motion from two toothed sectors, A B, and which are also caused to act together by the teeth on their edges; they are fixed upon two parallel spindles C D, which extend across the box; the sector A, has a lever or handle attached to it, and coming through the bottom of the box, and by pulling this, the Scarificator is wound up ready for action. The power is given by two horse-shoe springs, *e e*, figs. 1 and 5, one end of each is screwed upon the bottom of the box, and the other acts in a notch *ff*, in each sector, so as to press those sides upwards; the sectors are prevented from moving, except when required by a catch *g*, which enters notches cut in the handle of the sector A; this catch is a brass bar, laying across the bottom of the box, as shewn in figs. 3 and 5, it moves on a screw as a center pin at one end, and is pressed towards the sector by a slight spring (not seen); when it is to be discharged, a button *h* is pressed in, which disengages the catch *g*, from the notches in the piece A, and permits the springs to turn the sectors about, and by their teeth acting in the pinions, turns the lancets round at the same time, which is effected by the teeth of the two sectors engaging each other, in order that they may not operate so as to move the whole instrument upon the skin, as is the case in the common scarificator.

Fig. 4, shews that the handle of the sector A has two notches in it, for the catch *g*, when it is caught upon the first of these, the instrument is in the position of fig. 3, which is the half-cock, the lancets standing directly upright out of the box; in this position, the depth they are intended to penetrate, is adjusted by means of a screw *k*, passing through the bottom of the box; it is tapped into a piece of brass *l*, which is screwed to the lid *m* of the box; the piece

of

of brass is bent, as shewn in fig. 5, that it may clear the lancets and their spindles; when the screw is turned, it is evident that it will raise or lower the lid of the box, and cause the lancets to protrude more or less through it, and consequently enters a greater or less depth into the skin.

When the instrument is to be used, the handle of the sector A is to be drawn back into the position of fig. 4, which is at the full cock; the lancets are now turned down wholly within the box, and the springs wound up; the lid is then to be applied flat upon the raised-up skin of the part to be scarified; and by pushing in the button *h*, the catch *g* is moved round on its center pin, and pushed out of the notches in the handle of the sector A; the springs now turn the sectors, and the lancets fly out of the box with inconceivable rapidity; and making as many punctures in the skin, return into the box, having made exactly half a turn with their respective arbors. The dimensions of the instrument may be ascertained by the scale of inches annexed to the drawing.

TWENTY GUINEAS *were this Session voted to Mr.* GEORGE PRIOR, *Jun. of Otley, in Yorkshire, for an Improved Remontoire Escapement for Pendulum Clocks. The following Communication was received from him, an Explanatory Engraving is annexed, and a Model is preserved in the Society's Repository.*

SIR,

HAVING invented and made a remontoire escapement for long or short pendulum clocks, which I think will be much approved

approved of, I have taken the liberty to send you a model, with a drawing and description of the same, which I shall thank you to lay before the Society for the Encouragement of Arts, Manufactures and Commerce.

In this escapement there is not any more friction than in that which I had the honor of obtaining a bounty and a medal for, from your very honorable Society, in 1809, by whom it was allowed to have much less friction than any before invented. The advantage of this escapement is such as certainly to give the same exact and equal impulse to the pendulum without any friction, and which cannot be at all affected by any irregularities or variations arising by the clogging of oil and increasing of friction from the train, except during the very small part of the vibration that the pendulum is removing the spring detents from off the points of the teeth of the escape wheel, the effect of which can never be discovered in the rate by any variation the oil on the pivots and the increase of friction can ever produce, as long as the wheels will be able to wind up the renovating spring, which will be nearly as long as they can move at all, as the renovating spring has not either to be wound up quick, or to be pushed beyond any catch or spring to keep it in its proper situation, nor can there ever be any increase of friction in winding-up the renovating spring, as it is formed in as near a right line as possible; consequently must go almost endless without cleaning, and will never require any oil, (if all the parts of friction in the whole escapement be added together, they will not amount to the breadth of the acting part of the pallet of a common vertical watch verge, which every watch-maker knows acts without oil) still keeping the pendulum vibrating up to the same arc, which of course cannot avoid keeping time, if properly regulated for expansion, and which must be a very desirable

Mr. Geo: Prior Jun.rs Improved Remontoire Escapement.

Fig: 1.

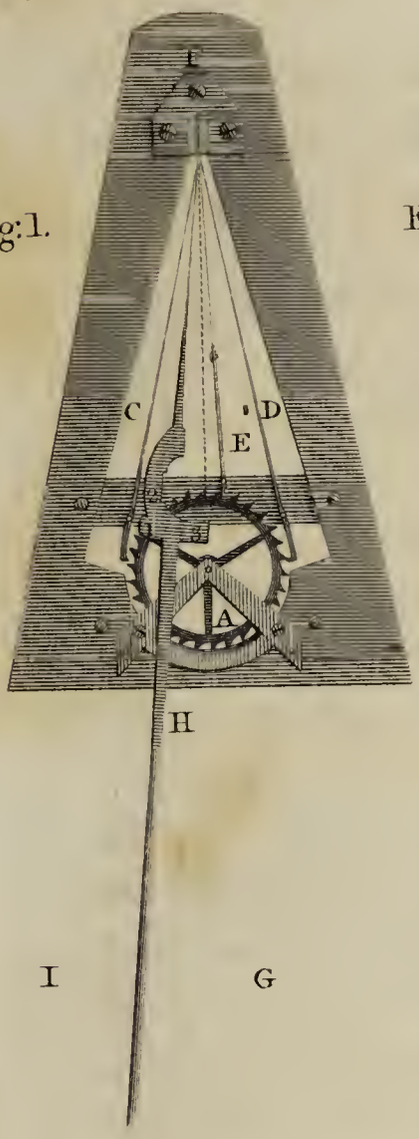


Fig: 2.

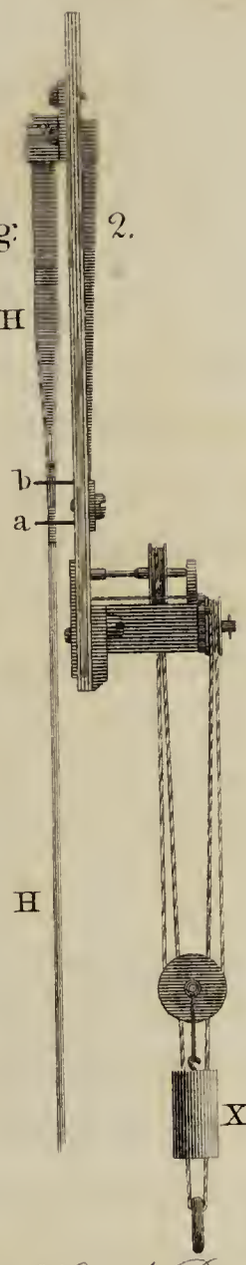
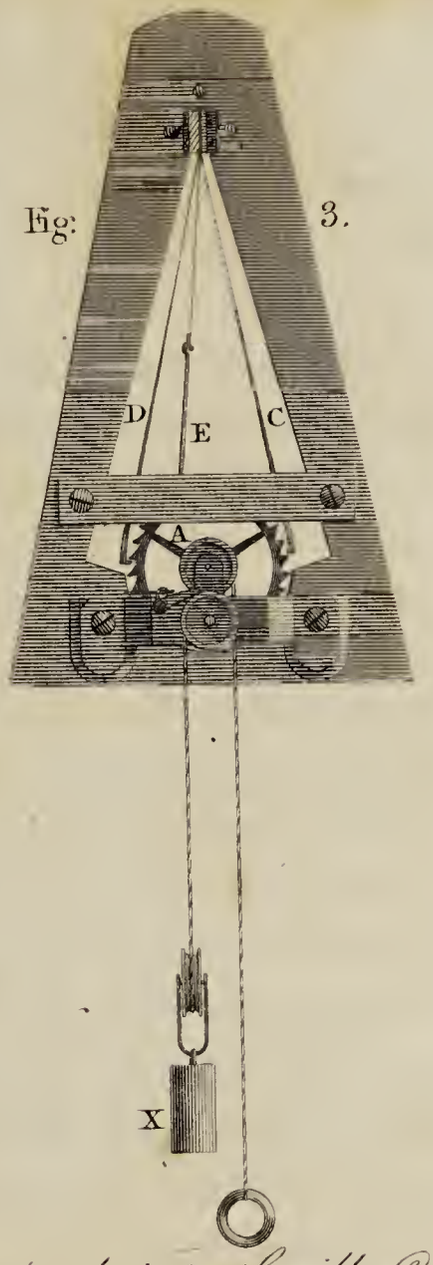


Fig: 3.



Mr. Richard Bridgen's Head Piece, to obviate the ill effects of Water Gilding.

Fig: 4.

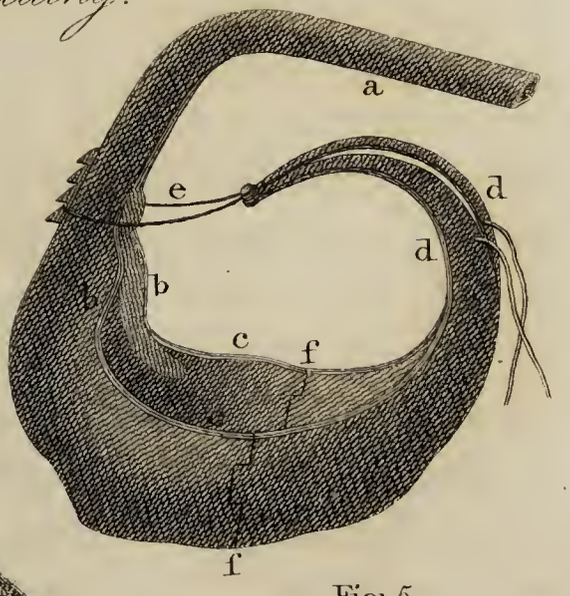


Fig: 5.

Engraved by J. Porter.

desirable attainment for regulators, for astronomical and other observations, where the greatest accuracy is required, as regulators once properly regulated, ought to go as long as can possibly be contrived, without making the slightest alteration in them.

The complex contrivance of all remontoire escapements I am acquainted with, has always prevented their use, as no good performance, except for a short time, can be produced from them, as they are all liable to want frequent oiling or cleaning; even Mr. Massey's, rewarded by the Society of Arts, Manufactures and Commerce, which is the most simple and best that I know, must frequently want oiling, or it will stop, owing to the friction of the teeth of the escape wheel in sliding up the inclined planes of the renovating springs to wind them up.

I am, Sir,

Your most obedient servant,

GEORE PRIOR, JUN.

Yorkshire, Otley, April 8th, 1811.

To C. TAYLOR, M. D. SEC.

Explanation of the Engravings of Mr. George Prior, Jun.'s, Remontoire Escapement. Plate 9, Figs. 1, 2 *and* 3.

THE swing wheel A, figs. 1 and 3, has thirty teeth cut in its periphery, and is constantly urged forwards by the maintaining power, which, in the model represented in the engraving, is supplied by a small weight X,

figs.

figs. 2 and 3; C D are two spring detents catching the teeth of the wheel alternately; these are, at the proper intervals, unlocked by the parts marked 2 and 3, fig. 1, upon the pendulum rod H, intercepting small pins *a b*, fig. 2, projecting from the detents, as it vibrates towards the one or the other; E is the renovating or remontoire spring, fixed to the same stud F as the detents; it is wound-up by the highest tooth of the wheel, as seen in fig. 1, (its position when unwound being shewn by the dotted line). This being the case, suppose a tooth of the wheel is caught by the detent D, which prevents the wheel from moving any further, and keeps the renovating spring from escaping off the point of the tooth; in this position, the pendulum is quite detached from the wheel; now, if the pendulum be caused to vibrate towards G, the part of it marked 2 comes against the pin *b*, fig. 2, projecting from the renovating spring E, and pushes this spring from the point of the wheel's tooth; on vibrating a little farther, it removes the detent D, which detained the wheel, by the part 3 striking the pin (*a*, fig. 2) which projects from the detent; the maintaining power of the clock causes the wheel (thus unlocked) to advance, until detained by a tooth resting upon the end of the detent C, on the opposite side; by this means the renovating spring will be clear of the tooth of the wheel as it returns with the pendulum, and gives it an impulse, by its pin *b* pressing against the part 2 of the pendulum, until the spring comes to the position shewn by the dotted line, in which position it is unwound, and rests against a pin fixed in the cross-bar of the plate; the pendulum continues vibrating towards I, nearly to the extent of its vibration, when the part 1 meets the pin in the detent C, and removes it from the wheel and unlocks it; the maintaining power now carries it forward, pushing the renovating spring E before

before it, until another tooth is caught by the detent D, which detains the wheel in the position first described, the renovating spring being wound up ready to give another impulse to the pendulum.

N. B. The pin *b*, fig. 2, is not fixed to the renovating spring itself, but is part of a piece of brass, which is screwed fast to the renovating spring, and is made very slender near the screw which fastens it; this permits the end of the renovating spring to give way, if, by the weight being taken off the clock, or any other accident, the escape-wheel should be moved backwards, so as to catch on the detents improperly.

The following observations are necessary to be attended to in this Escapement.

1st. That the renovating and detent springs must spring from one centre, and as similarly as possible.

2d. That the force applied to the train must be so much more than what will wind up the renovating spring, as will overcome the influence of oil and friction on the pivots of the machine.

3d. That the renovating spring when unwound, must rest against the point of the tooth of the wheel, which will be an advantage, as it thereby takes as much force off the tooth of the wheel resting against the detent spring, as is equal to the pressure of the renovating spring C, against the face of the tooth of the wheel.

4th. The detent springs must be made as slender and light as possible, though whatever force they take from the pen-

dulum, by their elasticity in removing them to unlock the wheel, so much force they return to the pendulum in following it, to where it removed them from, therefore action and reaction will be equal in contrary directions.

5th. That it is unnecessary for the pendulum to remove the detent or renovating springs, much further than is necessary to free the teeth of the wheel, as it will always vibrate up to the same arc; in table clocks it ought to remove them further, so that it can go when not placed exactly level, or what is generally termed, out of the beat.

TWENTY GUINEAS *were this Session voted to Mr.* RICHARD BRIDGEN, *No.* 61, *Broad-Street, Bloomsbury, for his Invention of a Method to prevent the Inhalation of Noxious Vapours in Gilding Metals. The following Communications were received from him, an Explanatory Engraving is annexed, and the Apparatus is preserved in the Society's Repository.*

SIR,

IN consequence of the dreadful effects which have occurred to a friend of mine, from the perniciousness of his business as a water-gilder, I have been led to make a machine to prevent persons from having such disorders. I have had the satisfaction to find that my invention is found to answer, and

and that it will enable the men to work at the forge double the time they were enabled to do in the old method. In order to have them fairly tried, I have disposed of six of the machines, which are much approved of, and I have orders for several more. I hope the invention will meet with the approbation of the Society.

I am, Sir,

Your obedient humble servant,

RICHARD BRIDGEN.

No. 61, *Broad-Street, Bloomsbury,*
May 7th, 1810.

To C. Taylor, M. D. Sec.

It appeared from the enquiry of the Committee appointed to investigate the merits of Mr. Bridgen's invention, that the great injury which arises to the gilders, is from the noxious fumes of the mercury employed in this kind of gilding, and more especially from the act of rubbing the gilded metal after taking it out of the furnace, which operation the workmen are obliged to repeat frequently, and inhale the vapours of the mercury volatilized by the heat.

That the men are in a considerable degree protected from the injury whilst the work is in the furnace, yet sometimes the fumes are forced down the chimney upon them.

That the quantity of crude mercury collected in one of their chimnies is frequently considerable, and that thirty pound of crude mercury were lately collected in one chimney in Pickett-street where this business was carried on.

That the act of rubbing the hot gilded metal taken from the fire, takes up three or four times more time than during its being in the furnace.

That the price of one of these machines is about one guinea; that it effectually prevents the mercury, or any noxious effluvia, from being inhaled; and that the operator may even stand over lighted rags dipped in brimstone, without suffering any injury, during the time he wears this apparatus.

Certificates.

A Certificate from Mr. John M'Dorrough, Water-gilder, No. 3, Castle-street, Holborn, stated, that Mr. Bridgen's preserver had been tried in his workshop, and that he thinks it particularly useful in large works, to prevent the quicksilver, when in a volatile state, from entering the mouth and nostrils, and injuring the bowels, nerves, and speech of the operator.

Mr. H. Weatherhead, Gilder, No. 54, Dean-street, Soho, certified, that he had made a fair trial of Mr. Bridgen's machine, and thinks it of infinite service.

Mr. Rees Rees, and Mr. Joseph Blackwell, No. 4, Middle-court, Charles-street, Long Acre, also stated, that they had tried Mr. Bridgen's invention, and believe that it will fully answer the end designed, namely, the preservation of the health of gilders and other persons exposed to the noxious effluvia from metals; that it is perfectly easy in application,

application, and not in the smallest degree inconvenient to the wearer of it.

Mr. PETER BROWN, Gilder, No. 5, Charles-court, Strand, certified, that Mr. Bridgen's preserver prevents any injury from quicksilver; that he can work with it eight or nine hours, and leave off as fresh as when he began.

Mr. C. JOHNSON, Gilder, No. 4, Prujean-square, Old Bailey, gave his opinion, that Mr. Bridgen's apparatus completely answers every purpose intended, prevents the steam of quicksilver or aquafortis from entering the mouth and nostrils, and secures the workmen from head-aches, and other inward complaints, to which they are subject; and that he is certain if such apparatus was worn from their first engaging in the business, that gilders would never be hurt.

Description of the Engravings of Mr. Richard Bridgen's Apparatus for Water-gilders. Plate 9, Figs. 4 and 5.

THIS apparatus consists of a kind of leather mask or hood, which is fitted to the mouth and nose of the operator, and communicates with a pipe which turns backwards over his head, so that he breathes the air from behind him, which is not supposed to be contaminated by the noxious fumes of the mercury. The mask is shown detached from the head, at fig. 5, where *a* is the pipe, enlarging as it

descends to a shape proper to receive and fit the nose, mouth and chin; the edges *b b*, *c c*, are stuffed with some elastic material, which adapts it to the forms of the nose and the cheeks; it is held on by the parts *d d*, which are curved so as to enclose the back of the head, and a string *e*, passing through holes in the ends of the parts *d d*, and being hooked into notches made in a piece of wood fixed on the front of the pipe *a*, draws it tight; the halves *d d*, are also tied together behind by strings, as shewn in fig. 4, and are connected with the front piece by hinges *f f*, fig. 5, so that they will open to take the mask off the head. A flexible tube of oiled silk may, if thought necessary, be tied to the end of the tube *a*, and conveyed to the nearest window, so as to give the workman the pure atmospheric air, if it is thought that the air in the room is tainted by the mercury. It is scarce necessary to observe, that the fitting of the mask to the nose, cheeks, and under the chin, must be carefully done, so as to leave no spaces at which the airc an enter; and therefore it must be stuffed to fit the person who intends to wear it. The whole mask is made of leather, and the outside varnished.

The

The SILVER MEDAL *was this Session voted to Mr.* THOMAS WOOD, *of Great Berkhampstead, Herts, for his Invention to prevent prejudicial effects to persons employed in Pointing Needles. The following Communication was received from him, an Explanatory Engraving is annexed, and a Model of the Apparatus is preserved in the Society's Repository.*

SIR,

I HEREWITH submit to the inspection of the Society instituted for the Encouragement of Arts, &c. a model of an inclosed grindstone, intended to prevent prejudicial effects to the persons employed in pointing needles.

This grindstone is enclosed in a case of wood or metal, and hath a hood wherein a square of glass is inserted, designed to admit light on the articles under operation.

The particular advantages attending a grindstone suspended in this manner, with a hood and a damp cloth, are, that the stream or current of air, formed by the motion of the stone on its axis, is confined by the case under the hood of which it enters, and carries with it the fine particles of steel and sand, which it deposits on the lower part of the inside of the wet cloth, which forms the connection between the sides of the case, by these means rendering the operation of pointing needles less pernicious to the health of the operator. The stone may be worked by hand, by water, or machinery.

I am, Sir,

Most respectfully,

THOMAS WOOD.

Great Berkhampstead, Herts,
January 25, 1811.

To C. TAYLOR, M. D. SEC.

Description of the Engraving of Mr. Thomas Wood's, Improvement in the Grindstones for Pointing Needles. Plate 10, *Fig.* 1.

THE grindstone A is enclosed in a box or case, formed of two circles of wood, one marked B, and another on the opposite side, which cannot be seen in this view; *a a* are two thin iron plates placed so near to the stone, as to be as close to it as possible without touching it; two other plates *b*, support a pane of glass at *c*, which at the same time that it prevents the dust from being thrown over the stone into the air, admits light to that part of the stone where the needles are applied; the remaining space between the edges of the two circular boards B, is filled up by a coarse cloth D, which encompasses about $\frac{3}{4}$ of the edge of the stone, and is then hooked up to the iron plates *a*, by means of two bent pieces of plate iron, to which the cloth is sewed, one of which is seen at *d*; and these are hooked upon other bent pieces, which form part of the plate *a a*; the cloth is wetted when put on, and will then catch the dust which is produced by the grinding, and when it has accumulated much, by unhooking the cloth it may be shook out, and the cloth being wetted is hooked on again; as the stone wears down the piece of plate iron *e*, situated in a groove formed by the edges of the plate *a*, is slided forwards to follow up the reduced edge of the stone, and other plates are put into the groove after *e*, when they are required; the case B is supported by a cross-bar of the frame in which the stone revolves, and which may be made in this or in any other form; the stone is turned in the usual manner of grinding-mills for needles, by a strap passing round a rigger, fixed on the end of its spindle; but this cannot be seen in this view, it being hidden behind the stone.

The

The SILVER MEDAL *was this Session voted to Mr.* GEORGE WEBSTER, *Leeds, for his mode of conveying Steam from Boilers. The following Communication was received from him, an Explanatory Engraving is annexed, and a Model of the Apparatus is preserved in the Society's Repository.*

SIR,

IT is with pleasure that I communicate to you the contents of this paper, hoping that this invention will be beneficial to the public; the leading feature of the contrivance is simplicity, and that may possibly be a fair recommendation, at least such it seems to me.

I have just finished a new erection, for my better accommodation in the whitening and stoving of woollen cloths, and having been long annoyed in this business with the steam from the hot water in the pans, I determined if possible to get quit of it; besides I had ample proof in my old building, how injurious the steam was to the timbers of the floors, &c. Permit me to say, that I spent a decent sum of money to no purpose, and was giving up the idea, in despair of its accomplishment, when I hit upon this expedient, which answers my most sanguine desires.

I presume that this easy method of carrying away steam has never yet been in practice, and if once known will be of very considerable utility. In the numerous instances in trades where steam is inconvenient, it offers a ready riddance; to the timber in buildings, and to the furniture in houses, private kitchens, &c. it affords a desired security; but

but in many trades, as glue-makers, tallow-chandlers, &c. where the effluvia, united with or without water, is offensive and obnoxious, it must be doubly and trebly valuable; and these cases are more numerous than I can recite or am acquainted with. The evaporating matter needs no longer to be the plague of the workmen, or the nuisance of the neighbourhood.

Hoping that the plan, though simple, and that the object, though not of the first magnitude, will be deemed worthy of the approbation of the Society,

I remain, Sir,

Your most obedient servant,

GEORGE WEBSTER.

Stover, Leeds.

Leeds, April 16, 1810.

To C. Taylor, M. D. Sec.

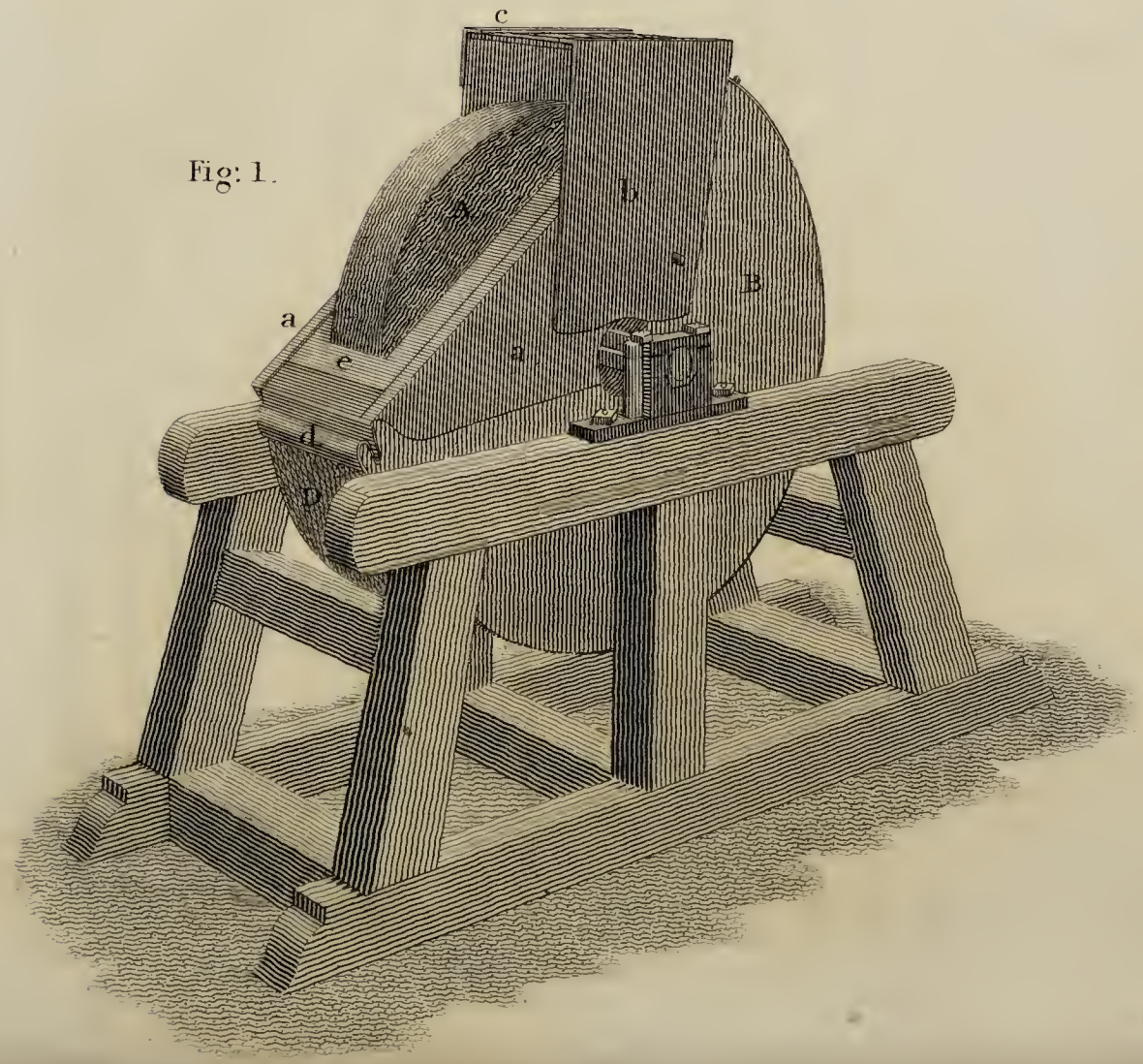
SIR,

In the model I have sent to the Society, the steam chimney is carried up as high as the smoke chimney, which is the case at my works, being my first essay; but this is not immediately necessary, for in the bleach house belonging to Messrs. Benyon, Benyon, and Baze, flax-spinners, of this place, I advised the steam to enter the smoke flue, about six feet above the top of the pan, and with the same good effect.

Several of my friends here have adopted them in their kitchens,

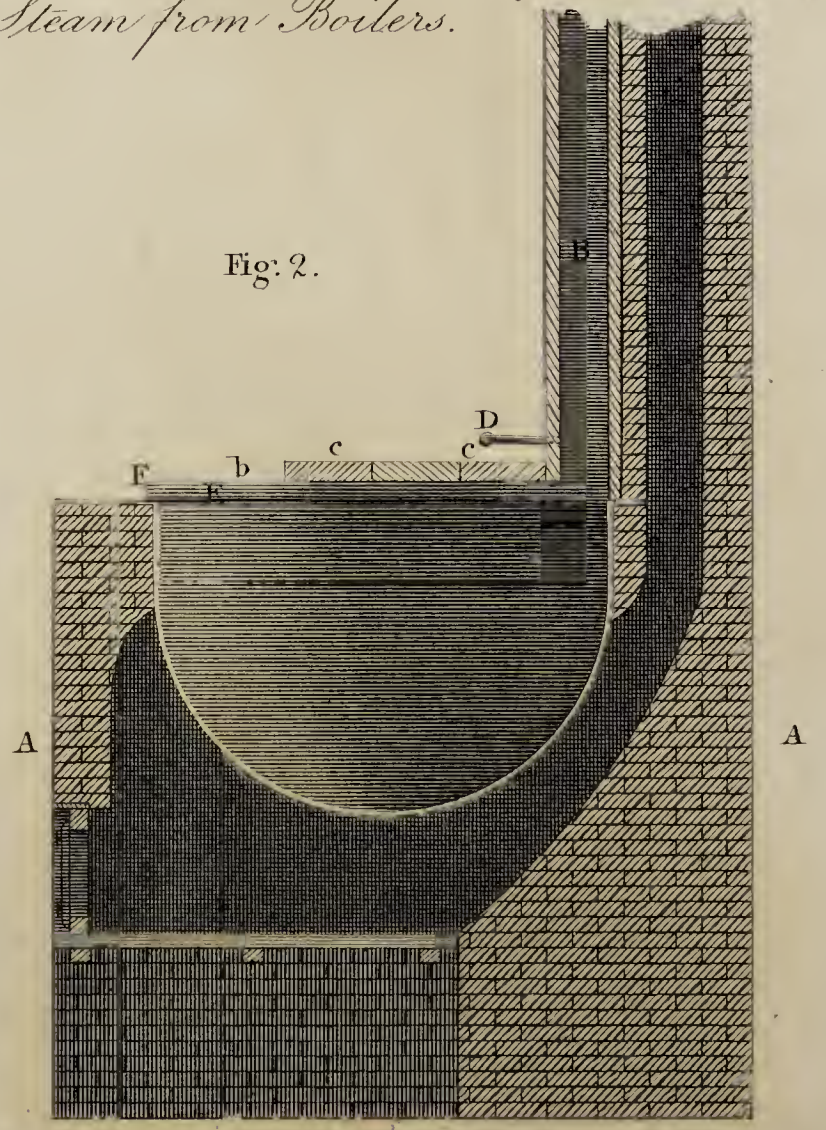
Mr. Woods's Enclosed Grindstone, for Pointing Needles.

Fig: 1.



Mr. Webster's Method of carrying off Steam from Boilers.

Fig: 2.



kitchens, and wash and brew-houses. The steam flues are variously curved, as the situations required them to reach the nearest or most convenient smoke chimney, and with the same uniformly good success. I would, however, recommend, that at the lower part of the aperture, where the steam enters a smoke flue, a stone may be made to project a little way into the chimney, in order to break the current of the ascending smoke, and thereby facilitate the entrance of the steam.

I would remark further, that in some cases a curved or angular form may possibly be found the most eligible for the steam chimney, in order to prevent a gust of wind, or any other casualty, from forcing soot down into the liquid in the pan.—I have not yet witnessed any immediate necessity for it myself, and therefore merely suggest it as possible, but yet very easily remedied.

I am, Sir,

Your obedient servant,

GEORGE WEBSTER.

Leeds, May 23, 1811.

To C. Taylor, M. D. Sec.

This is to certify that we the undersigned have inspected Mr. Webster's contrivance for clearing his room from steam, and conveying it from his pan up what he calls a steam chimney, and found it to answer the desired purpose very effectually.

George Bischoff, Jun. Merchant.

John Cawood, Iron-founder.

Reference

Reference to the Engraving of a section of Mr. Webster's Apparatus, for conveying Steam from Boilers, represented in Plate 10, *Fig.* 2.

A A, the brickwork surrounding the pan.

B, the steam chimney, made of wood, about two feet broad and six inches deep. A small opening at the back part of the pan admits the steam into this chimney, it may from thence be carried up to the top of the building or turned into any smoke chimney near at hand.

In order to keep the water in the pan as hot as possible during the night, there are two dampers in the steam chimney at D, and if both these dampers are shut, and the whole top of the pan covered closely over at *c*, the boiling water even when the fire is withdrawn, will keep hot for the workmen till the next morning.

C C, are loose boards, fitting close to each other, and covering compleatly the better half of the circle of the top of the pan; and upon this circumstance depends the whole secret of getting quit of the steam. If you remove these boards or partial coverings, the steam chimney loses all its use. The letter *b* shews the part of the top of the pan which should be left open to admit to the workmen a ready communication with the hot water, and through this open part a current of cold air is constantly seen to press and force the steam rapidly up the steam chimney.

It is proper to add, that there must always be an empty space of two or three inches between the surface of the hot water and the under part of the cover *c c*, so as to permit the steam to pass to the bottom of the steam chimney. To effect this purpose, and at the same time to allow the copper to be full

full of hot water, a rim or curb of wood F, about three inches thick, should be fixed upon the top of the copper, and upon this the covering boards *c c* placed; this allows sufficient room for the steam to press forward to the steam chimney at all times.

The cover and wooden steam chimney are removeable, and may serve for another copper if both are not wanted at the same time.

The SILVER MEDAL and TEN GUINEAS *were this Session voted to Mr.* JOHN PRIOR, *of Nessfield, near Shipton in Craven, for Improvements in the striking part of a Clock. The following Communications were received from him, an Explanatory Engraving is annexed, and a Model of the Improvement is preserved in the Society's Repository.*

SIR,

I WAS engaged to make, some time ago, a clock to go eight days, strike the quarters and hours, and to show minutes and hours upon four faces, on the external part of the steeple of a new church in Kighley, Yorkshire.

The wheel which strikes the quarters and that for the hours, when they came from the foundry, weighed between fifty and sixty pounds of cast brass. The hours are struck in a spiral cut upon a plate screwed to the wheel, like that I had the

the honour to obtain a bounty for from the Society for the Encouragement of Arts, &c.; and am putting my son's escapement of a pendulum to it, for which he had the like honour.

Sometime in the spring of the last year, I thought if these two wheels could be made without teeth, pins might be put into cast iron as well as brass, and the difference of the prices of those two metals and the workmanship necessary for each, would at least be five guineas less in cast iron than cast brass, for two such wheels as the above, for a large church clock.

In contemplating upon the subject, I invented and had nearly finished in workmanship the last year, the enclosed striking part, but being so near the recess of the Society, I could not finish it in time.

Although there are many detached escapements for clocks and watches, there are not that I know of any detached striking parts, except this, which I have sent for the inspection of the Society for the Encouragement of Arts, &c. which I beg you will lay before them at their first meeting.

My new invented method of striking is easily and expeditiously made, as it lays aside the train of wheels and pinions, which is much better substituted by a small part of a circle, at the end of a lever toothed, which is elevated with the hammer, and may be put out of the frame of the clock turning a fly forwards and backwards. The first motion is to regulate the rapidity with which the hammer would strike, and the latter has nothing to do with the power that struck the hammer, but is acted on by gravity, which will regulate the intervals between the strokes more accurately than any train of wheels and pinions can do with a fly; at the end of which motion it unlocks a detent, which stops against the pins that strike the hammer in the wheel without teeth; and as the elevation of the lever puts forwards the count wheel one tooth, till one of the twelve pins for the use of counting the

the hours, or the proper number to be struck, comes into the way of the lever, and then prevents it from unlocking the detent, then the clock gives over striking till the next hour.

It is to be remarked, that if this striking part had turned the fly only one way, the same number of turns could not bridle the rapidity of the motion of the hammer, therefore it follows, that the striking part will raise a heavier hammer than any one made to strike with a train of wheels and pinions can do.

I have the honor to be, Sir,

Your much obliged humble servant,

JOHN PRIOR.

P. S. Although the weight of the lever keeps the detent from being locked, it is not necessary it should, for a body in motion requires a great resistance to stop it, as at the end of the back motion of the fly, at which time it unlocks the detent, it has no occasion to be unlocked before, therefore the lever will have more than sufficient power to do that business; if it be made as light again as it is, or more, and whatever weight is taken from the lever may be taken from the first power, and still the striking part will elevate as heavy a hammer as before, and the first power or the weight will be more applied to elevate the hammer, and less to do with that which is substituted as a train of wheels or pinions.

Nessfield, near Skipton in Craven,
Yorkshire, April 10, 1811.

To C. Taylor, M. D. Sec.

Description

Description of Mr. John Prior's new Striking Part of a Clock, Plate 11, *Figs.* 1, 2, *and* 3.

In this plate three elevations of this mechanism are given; fig. 1, is a section of the wheels, detents, &c., the front plate of the frame being removed to shew them; fig. 2, is a side view thereof; and fig. 3, shews the count-wheel, which is situated outside of the plate composing the frame; in all these figures the same letters are employed for reference to all the engravings.

The engravings only represent the striking mechanism, detached from the going part of the clock; A, fig. 1, is the barrel for the striking train, with a line *a* wound round it, and by means of a weight constantly giving the barrel a tendency to revolve in the direction of the arrow, and turn the wheel B with it, (this barrel and wheel is omitted in fig. 2, to avoid confusion); the wheel turns a pinion, on the arbor of which is a wheel *c*, containing thirteen pins, which project from its face, and, as it revolves successively, raise the tail *b* (shown by dots in fig. 1,) of the hammer D; when a pin leaves the hammer tail, the spring *d* throws the hammer against the bell E to strike the hour; this is the train of wheel-work for the striking movement; the detents for locking and unlocking these are as follows; a detent *e*, fig. 1, fixed to an arbor *f* extending across the frame, locks the pin-wheel C by receiving one of the pins on its end; the detent is urged into this position by a spring *g*, fig. 2; one of the pivots of the arbor for the hammer is supported in a cock F placed in the center of the space between the plates; the same pivot hole contains one pivot of another arbor *h*, fig. 2, which is therefore in a right line with the arbor of the hammer, and appears in that figure as if in one piece, but in reality

reality has no connection with the hammer, except that a pin, *i*, projecting from the hammer-tail, intercepts another pin fixed into the arbor *h*, so that every time the hammer is thrown back by the pins of the striking wheel raising its tail, the arbor *h* is turned round a small quantity; on this arbor is fixed a long lever K, fig. 1, which has at its extreme end a circular rack of teeth, acting upon a pinion, or an arbor, carrying a fly, such as is always used for the striking movement; the fly is shewn edgeways in fig. 1, at *l*, but is omitted in the other figures to avoid confusion; it is this fly which regulates the time of the strokes; their number is ascertained by a count-wheel shewn at G, in fig. 3; this is placed to turn round on a stud or pin on the outside of one of the plates of the frame; it has seventy-eight ratchet teeth cut in its circumference, and has a detent, H, moving round on the same center pin; this has a piece of watch-spring *m* acting as a click to turn the wheel round when the detent H is lifted up, but when this is let fall its click slips over the teeth of the wheel; *n* is a similar click, but fixed to the frame plate, to prevent the wheel turning backwards; the count-wheel has pins projecting from it on the side next the frame plate, and these are arranged in the same order as the count-wheel always is, the first pair of pins being situated only one tooth distance; the second interval is two teeth, then three, four, and so on, the interval between the pins increasing one tooth each time up to twelve, making in all seventy-eight teeth; these pins are acted upon by an arm *p*, fastened to the rack K, and having a stud at the end which comes through a circular slit or aperture, (shewn in fig. 3,) in the frame plate, and rests upon the pins in the count-wheel at proper intervals.

Operation of the Mechanism.

When the movement is at rest, the pin wheel *c* is locked by the detent *e*; at every hour this is pushed away from the center of the wheel by a pin in that wheel of the going part of the clock, which makes one revolution in an hour; the connection of these parts is not shewn in the drawing, but it may be done in various ways, as by a pin fixed in the detent, and passing through an aperture in the frame plate, or by a lever affixed to the arbor *f*, fig. 2, of the detent; the means will depend on the kind of clock the movement is applied to; all that is required being to push the end of the detent *e* so far from the center of the pin-wheel as to unlock its pins.

The weight now sets the wheels in motion, and the pins lift up the tail of the hammer to strike the hour; as the hammer is thrown back, it raises the rack K, and turns the pinions and fly as before explained, the motion of the pin-wheel and hammer being regulated by this fly, and prevented from accelerating; when the pin leaves the hammer-tail, the hammer, by its spring, strikes the bell, being detached from the neck and fly in its return, as is evident from inspection of fig. 2, by the time the hammer falls, the locking detent being relieved from the going part of the clock, resumes its original position, and prevents the wheel turning any further; the weight of the rack K causes it to descend, and the fly (turning in a contrary direction to what it did before) regulates the period of its descent; when the rack arrives at the position of fig. 1, it strikes a small arm projecting from the arbor *f*, and by this means pushes the locking detent away from the wheel which now sets off again, raising the hammer as before.

This

Mr. John Prior's New Striking Part for a Clock.

Fig: 1.

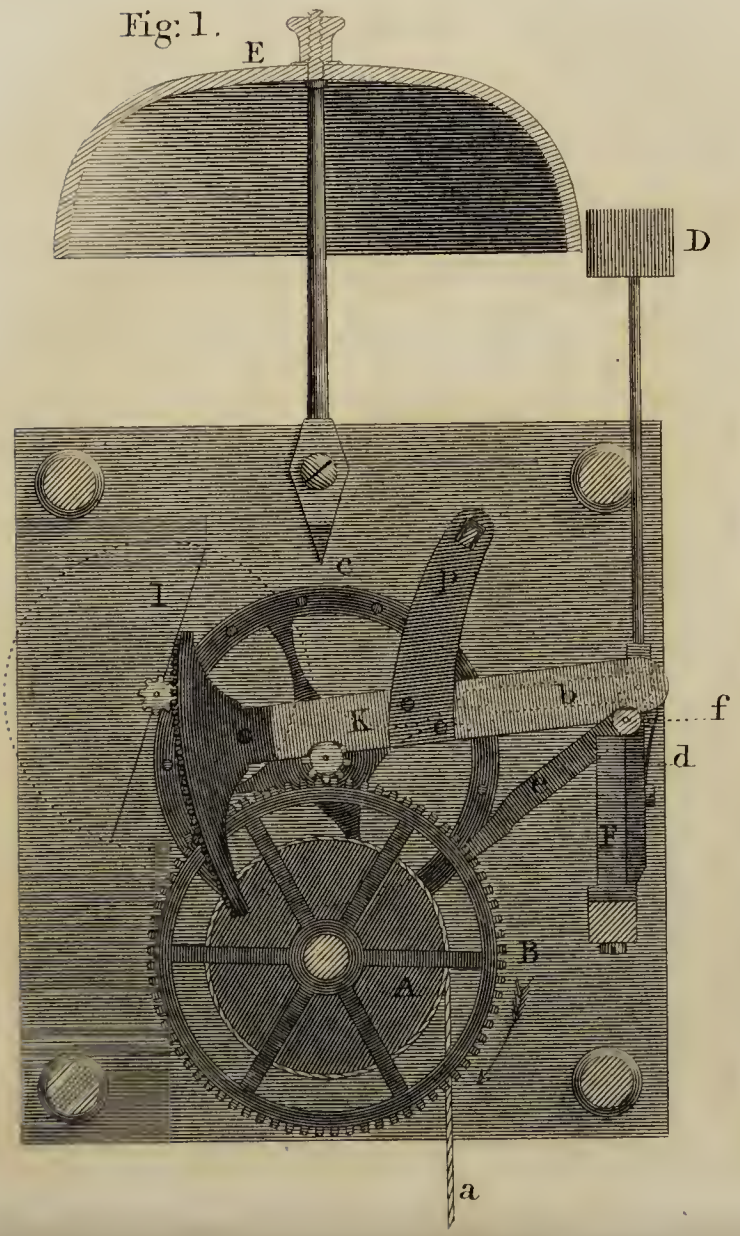


Fig: 2.

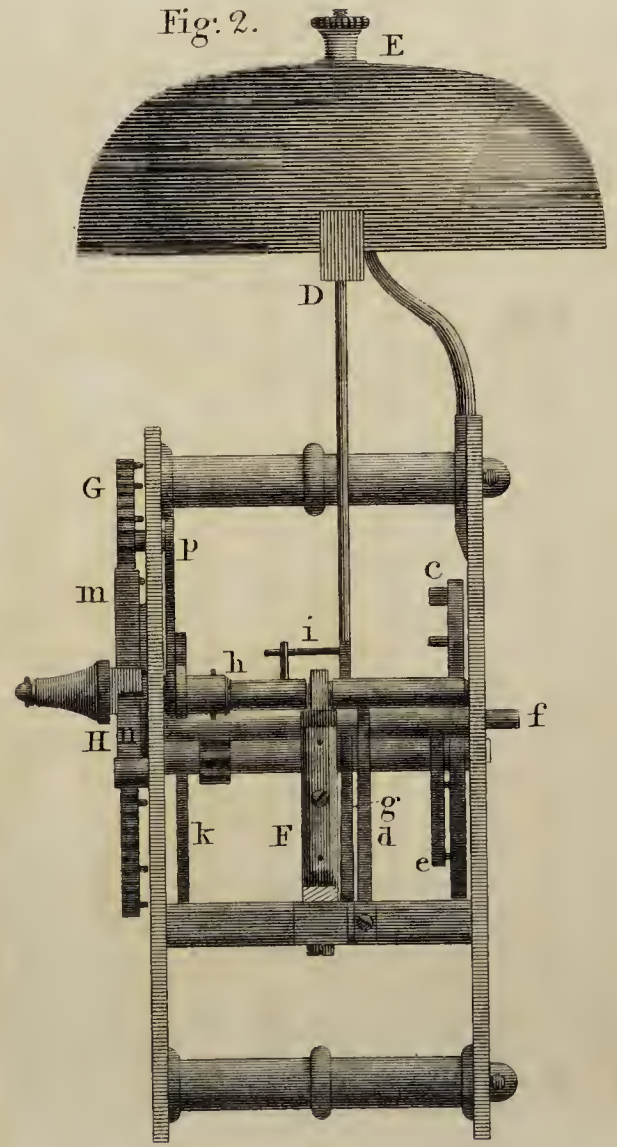
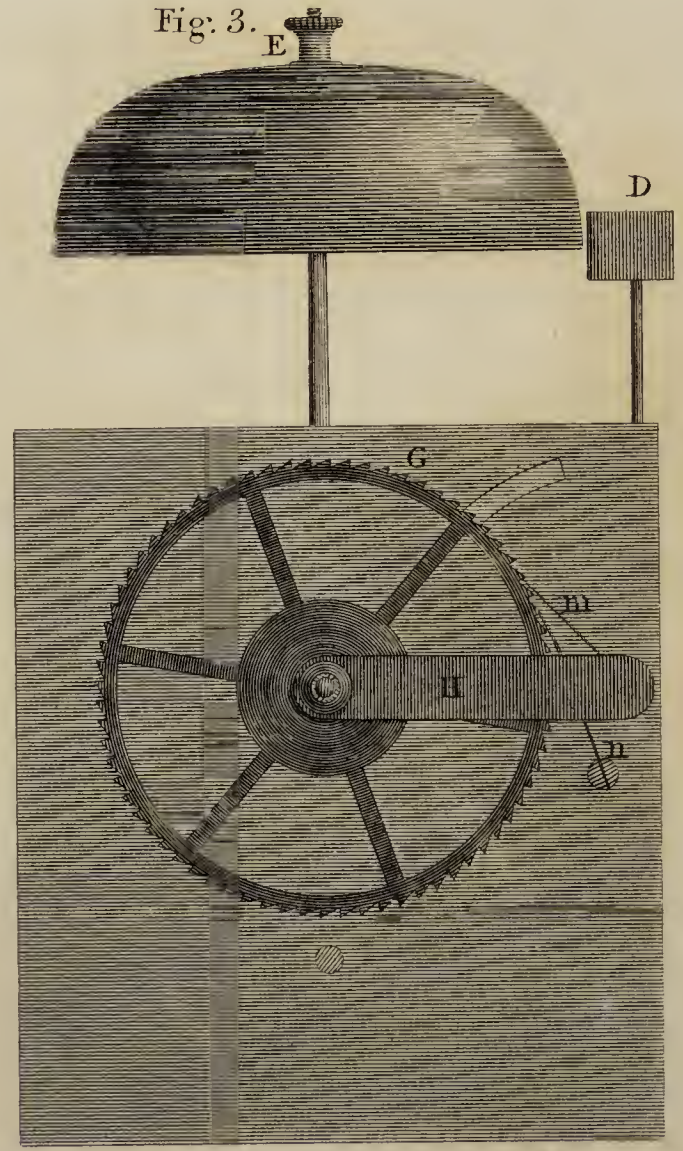


Fig: 3.



Engraved by S. Porter.

This explains the application of the fly to regulate the interval between the strokes; but it remains to mention the means by which the proper number of strokes are made. The rack K has a pin projecting from it, and coming through a hole in the plate, raises up the lever H, which, as before explained, turns the count-wheel G round one tooth at every stroke of the hammer, but after having made the intended number of strokes, one of the pins of the count-wheel comes into such a position that the arm *p* of the rack rests upon it, and prevents the rack descending low enough to reach the arm of the detent *e*; the wheel is now locked, and must wait the expiration of another hour before it resumes its action, by the locking detent being moved by the going part of the clock; but when one stroke is made, the count-wheel being turned round one tooth, the pin is removed from the arm of the rack, and the striking continues till another pin is brought under it: the number of strokes the hammer will make therefore depends on the spaces between the pins in the count-wheel, and these are arranged as before mentioned, and as is well known to all clockmakers.

PAPERS

IN

COLONIES AND TRADE.

The GOLD MEDAL, *being the Premium offered, Class* 165, *for curing British White Herrings in the Dutch method, was this Session adjudged to* FRANCIS FORTUNE, *Esq. of Lower Thames Street, from whom the following Communications were received*

SIR,

I HAVE taken the liberty to forward to the Society of Arts, &c., two half barrels and two kegs of herrings cured by Dutch prisoners after the Dutch method of cure, and I shall feel myself obliged if you will give me notice of the meeting of the Committee on this business, and I will attend to explain the mode of cure, when I hope I shall be thought worthy of the Gold Medal.

I am, Sir,
Your most obedient servant,
FRANCIS FORTUNE.

No. 8, *Lower Thames-Street,*
February 5, 1811,

To C. TAYLOR, M. D. SEC.

Certificate.

This is to certify, that the two half barrels and two kegs of herrings sent to the Society of Arts, &c. are fair samples of four hundred barrels, cured by Dutch prisoners after the Dutch mode this year at Yarmouth and Broadstairs, on account of Mr. Fortune.

J. Lewis.
Thomas Bowen.

Isle of Dogs, Feb. 4th, 1811.

SIR,

Being desirous that the greatest degree of publicity should be given to every particular relative to the manner in which the Dutch were used to cure their herrings; and being aware of the extensive circulation of the Transactions of the Society for the Encouragement of Arts, &c. I feel anxious that a communication likely to be referred to by so many for information, should be intelligible and satisfactory. Under these impressions, and observing that the Society desire "that papers sent to them should be full, clear, and explicit," rather in the form of essays than of letters, I have stated more than perhaps may appear at first sight absolutely necessary, but I flatter myself not more than may prove really useful.

In the deep sea (which is the principal fishery for herrings) the nets are cast from the busses by sunset, and they drive by them alone expecting the shoals, the approach of which is generally indicated by small quantities of fish; and their arrival by immense flights of sea fowl. The best fishing

is

is with the wind off shore, for, when it blows in a contrary direction, the shoals are broken and dispersed, and the fishery is seldom successful while it continues in that point.

Immediately after the nets are hauled in, (which is often performed with considerable difficulty, by means of a windlass when they are full) the crew begin to gyp the fish, that is, to cut out the gill, which is followed by the float or swin, and divide the large jugular or spiral vein with a knife at the same time, endeavouring to waste as little of the blood as possible;—at this work the men are so expert, that some will gyp fifty in a minute.

Immediately after they are gypped, they are put into barrels, commencing with a layer of salt at the bottom, then a tier of fish, each side by side, back downwards, the tail of one touching the head of the other, next a layer of salt, and so alternately until the barrel is filled:—they are thus left, and the blood which issues from the fish, by dissolving the salt forms a pickle infinitely superior to any other that can be made. The herrings thus drained of their blood occupy less space, and the whole consequently sinks about one third down the barrel, but this sinking is at an end in about three or four days.

When these operations are being performed, the sea is often running mountains high; and it is not therefore to be supposed, that the barrels are so well coopered as not sometimes to allow the pickle to leak out; and in order to preserve the fish from being spoiled, which would otherwise happen in such cases, some of the gills and entrails are always put by in barrels with salt, in the same manner as the herrings, and yield a pickle of the same quality; with this pickle those barrels which have leaked are replenished, and the fish sustains no injury. Every operation is performed in the shade, into which the fish are immediately con-

veyed on their being hauled on board. Each day's fishing is kept separate with the greatest care. The salt used is mixed, and of three different sorts, viz. English, St. Ubes, and Alicant, and each barrel marked with the date of the month on it on which it was filled.

The advantages of gypping the herrings are, that the blood which issues in consequence of the operation from the fish, yields a natural pickle, and improves the flavour; whereas, if left in the fish, it becomes coagulated at the back-bone, and forms the first cause of decay. The mixture of blood and salt operated upon by the extreme heat of the weather during the summer fisheries, produces a fermentation which nearly parboils the herrings, and removes the coarse and raw flavour so often complained of. The gypping is likewise often performed on shore, observing the same precautions; the only difference is, that they are seldom in that case of so good a colour. Gypped herrings are never of so fine a quality as when kept in their own original pickle; their value consists in their softness and flavour; it is this mode of curing herrings that used to be the pride of the Dutch, and this is the kind which supplied their home consumption, and were so much esteemed by all classes of people in Holland.

In order, as far as it is possible, to give a proof of the correctness of the above assertion, I shall state a fact for the information of the Society. During the last year, I employed a number of Dutch fishermen, prisoners, and others, with Englishmen, in gypping and curing herrings; and at one time, my agent at Yarmouth was offered 4 *l.* per barrel for all the herrings he had cured there, by a Dutch captain, in order to their being taken to Holland, while ungypped herrings were worth only 36 *s.* per barrel. The herrings now

now under the consideration of your Society, are part of the quantity for which that offer was made.

Should the Society, after due consideration, think proper to adjudge me their Gold Medal, it will afford me much satisfaction, and convince me that my exertions have, in some degree, been beneficial to the community.

I am, Sir,

Your obedient servant,

FRANCIS FORTUNE.

No. 8, Lower Thames Street,
Feb. 26th, 1811.

To C. TAYLOR, M. D. SEC.

The SILVER MEDAL *of the Society was this Session voted to Mr.* PETER SLEAVIN, *No. 7, Little Brook-Street, Hampstead Road, for Curing British White Herrings. The following Communications were received from him.*

SIR,

I WILL thank you if you will have the goodness to lay before the Society, the sample I have sent of British Herrings cured by me in the Isle of Mann, as I have no doubt they are equal to the Dutch, or better, which I will explain if

if permitted to attend the Committee to whose consideration it may be referred.

The quantity I have cured, is only eight barrels of thirty-two gallons each; I therefore cannot claim under the precise form of the premiums offered by the Society, but if honoured with their notice, I will furnish you with further particulars on the subject.

I am, Sir,

Your very obliged humble servant,

PETER SLEAVIN.

No. 7, Little Brook-Street, Hampstead Road,
Dec. 4th, 1810.

To C. Taylor, M. D. Sec.

Certificate.

By a letter from Mr. John Head, to Mr. Sleavin, dated Douglas, Isle of Mann, Dec. 31st, 1810, it appears, that eight barrels of pickled herrings prepared by Mr. Sleavin, were shipped from thence.

Mr. Sleavin's Method of Curing Herrings.

When the herrings are taken and alive, break their gills with your finger and thumb completely from the backbone, which will in course cause the fish to bleed: then throw them into the liquor prepared as follows: viz. to three quarts of salt water, put five pounds of common salt, and

two

two pounds of bay salt, and when dissolved, let the whole be boiled. One peck of common salt, and half a peck of bay salt, put between the different layers of herrings, will be sufficient for one barrel. Let the herrings remain in this liquor for three weeks, they must then be taken out and gypped, and a fresh liquor made with one gallon of salt water, the gypping of the fish, one peck of common salt, and a quarter of a peck of bay salt, and when dissolved, some of the spare fish must be put in it to make the liquor rich, and the whole be boiled for an hour, but so slow as that it may not burn; then let it cool and strain it off. The fish must be repacked in clean barrels, the last mentioned liquor put to them, and be careful that the fish be covered and kept close.

P. SLEAVIN.

No. 7, Little Brook-Street, Hampstead Road,
April 6th, 1811.

RULES AND ORDERS

OF THE

SOCIETY,

FEBRUARY 20th, 1812.

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RULES AND ORDERS.

SECT. I.

Of the Officers, and Manner of their Election.

I. THERE shall be One President, Sixteen Vice-Presidents, Two Chairmen to each of the standing Committees of the Society, a Secretary, an Assistant Secretary, a Housekeeper, and a Collector of the subscription money; which officers shall be elected, by ballot, on the twenty-second day of March, annually; unless when that day happens on a Sunday, or Good Friday, or Public Fast-day, in any of which cases the election to be on the following day; and on that day no other business of the Society shall be transacted.

II. In order to this election, the President, one of the Vice-Presidents, or, in their absence, some other member appointed by the majority, shall take the chair at eleven of the clock in the forenoon; two ballotting glasses, marked A and B, shall be placed before the chair, the one for receiving the ballotting lists marked (A), and the other for receiving the ballotting lists marked (B), and stand open for receiving lists until two of the clock in the afternoon: at which hour the ballot shall be closed, when three scrutineers to each ballotting glass shall be nominated by the President, or presiding member, to examine the

lists; but, in case not more than five members shall attend to vote on that day, the officers of the preceding year shall be continued till the next general election. That at the beginning of every election of a President, Vice-President, or Vice-Presidents, Chairman or Chairmen, the presiding member shall begin by calling over the names of the persons proposed as candidate or candidates for that election, in order that it may be known whether such candidate or candidates be in arrear.

III. A sufficient number of printed ballotting lists of all the officers in being, according to the forms annexed (A B) shall be ready; in which if any member chooses an alteration, he is to strike his pen across the printed name or names of such as he disapproves, and write on the blank side the name or names of such as he would substitute in their place; and no printed list shall be circulated in any of the Society's rooms on the day of election but that recommended by the Society.

IV. Each member shall deliver his lists folded up to the President, or presiding member, to put into the glasses; and the collector, sitting on the side of the chair, with a list of the members before him, shall mark the name of each member so delivering in his lists.

V. When the ballot is closed, one of the scrutineers shall open and read aloud each list, and file it, while the other two or more mark the names; and when all the lists are drawn, the marking scrutineers shall cast up and report the same to the chair; after which the President, Vice-President, or presiding member, shall declare the persons who have the majority of votes to be the officers respectively for the ensuing year —Such election shall likewise be declared again at the next meeting of the Society.

VI. If

VI. If the President, or any of the Vice-Presidents, shall resign or die, the remaining Vice-Presidents shall continue to act and preside at the meetings of the Society, in the order they are placed in the election list, until the next annual meeting for the choice of officers, or some other general, or extraordinary general meeting, which the Society shall please to appoint for such particular election.

VII. If any of the offices of Secretary or Assistant Secretary, Housekeeper, or Collector, shall become vacant, a person shall be appointed, at the next meeting of the Society, to act in such respective office of Secretary, Assistant Secretary, Housekeeper, or Collector, until the next general meeting, or an extraordinary general meeting, which shall be appointed for electing a person by ballot, to fill the vacant office for the remaining part of the year.—In case the office of Secretary, Assistant Secretary, Housekeeper, or Collector, be at any time resigned, which resignation shall take place on a subsequent day, it shall be in the power of the Society to proceed to the election of a proper person to fill such office on such resignation taking place, or to nominate one to hold it *pro tempore*, until such office shall be filled up. But no person shall be entitled to ballot at the election of any of the said officers, in case of a vacancy by death, resignation, or removal, who shall not have been a member previous to the declaration of such vacancy, unless he shall become a perpetual member.

VIII. At all elections of officers, if the suffrages should be equal, the decision shall be by lots, prepared by the scrutineers, and drawn by the President, Vice-President, or presiding member.

IX. Notice of the annual, or of any occasional election of officers, shall be published three different days, in such

newspapers as the Society shall order, one week at least before the day of election.

X. Notwithstanding the election of officers is annual, the Society reserve to themselves the power of removing either their Secretary, Assistant Secretary, Housekeeper, or Collector, by two general or extraordinary general meetings; in which case the said officers shall be paid their salaries in such proportions as may be then due to them.

XI. Neither the Secretary, Assistant Secretary, the Housekeeper, nor the Collector of the Subscriptions, shall be members of this Society.

XII. No person, except he shall have been an officer the preceding year, shall be admitted as a candidate for any lucrative employment, without having personally presented his petition or memorial to the Society, sixteen days before the day of election; which petition or memorial shall be read immediately after the first, and again after the second reading of the minutes. "And in case of its being referred "to a committee to examine and report on the qualifications "of the candidates for any lucrative office, such committee "shall not enter on their examination of the candidates, "until within fourteen days of the day fixed for the elec- "tion (of which meeting for examination notice shall be "given to all the candidates), and they shall examine all the "candidates who attend for such purpose, in the order in "which their names occur in the alphabet." No member of this Society shall be eligible as a candidate for any lucrative employment in the gift of the Society, who shall be present, or act as a member, at any meeting or committee of the Society, after he has declared by word, message, or otherwise, his intention of becoming a candidate.

XIII. No officer who receives a salary, or servant, shall be

be entitled to any premium or bounty whatever from the Society.

XIV. No officer or servant shall presume, under any pretence whatsoever, to accept of any present or gratuity from any candidate for a premium or bounty, or any tradesman having dealings with the Society, or any person coming to see the machines, on account of such premium, bounty, dealing, or inspection.

XV. No officer, servant, or person, employed to shew the machines in the several repositories, shall accept any gratuity from the maker or seller of any machines made after models or machines, for which the Society have adjudged any premium or bounty.

XVI. A Messenger shall be chosen or removed at any meeting of the Society; and so long as he continues in their service, he shall be paid a salary of seventy pounds a year.

SECT. II.

Duty of the President, Vice-Presidents, and Chairmen.

I. The duty of the President, Vice-President (in the order they appear in the list), or Chairman, is to preside at all meetings, with his hat on if he pleases, to regulate the debates of the Society; to state and put questions, both in the affirmative and negative, according to the sense and intention of the meeting; to check irregularities, and keep all persons in order; to direct summonses for all extraordinary general meetings; and to execute, or see to the execution, of all the rules and orders of the Society.

II. The President, or any one of the Vice-Presidents, shall sign receipts for the subscription money.

SECT. III.

Business of the Secretary.

I. HE shall attend all meetings and committees of the Society; he shall take down all minutes of the committees, and produce them fairly written at the ensuing meetings. He shall read all the minutes of the meetings and committees to the Society; and translate such communications into English as shall be in any other language. He shall prepare all answers, when ordered by the Society, in such language as shall be directed, and lay the same before the Committee of Correspondence, for their examination, unless the Society shall judge an immediate answer necessary. He shall prepare an annual historical register of the Transactions of the Society, beginning every year from the first day of July, and ending the last day of June following. This register shall contain an account of all premiums bestowed, with the names of the persons who have received them, digested under proper heads: a list of the premiums offered by the Society, and upon what condition, and the number of members. He shall also prepare an account of the amount of annual and life subscriptions separately, the money in the Bank, and in the Collector's hands, as they shall have stood on the last day of June, and of other sums received during the preceding year; and what have been the expenses, in officers, servants, apartments, and workmen's and tradesmen's bills of all sorts. He shall prepare the list of members, advertisements, and other publications ordered by the Society; and take care that the same be properly and correctly printed: and his name, or that of the Assistant Secretary, as by order of the Society, shall be signed to all publications. All the letters or written papers of the Society shall be kept

under

under his care, and ready to be produced by him for the inspection of the members. He shall visit manufactories, or apply to manufacturers for information, when required by the Society; and he shall, as much as possible, endeavour to make himself acquainted with the nature and circumstances of the several arts and manufactures of this and other countries.

II. The Secretary shall read the whole of the Eleventh Section of the Book of Rules and Orders, at the time when the standing Committees are appointed to be declared in the Society; and also at the opening of the business in the general committee of election, ordered to be holden on the Friday following annually. And in consideration of his constant attendance, abilities, and diligence, he shall be paid a salary of two hundred and fifty pounds a year, and be supplied with coals and candles.

SECT. IV.

Business of the Assistant Secretary.

I. THE Assistant Secretary shall attend every day at the office of the Society from the hours of ten to two, during the sessions of the Society, and such further time as may be necessary to perform the business of the Society in his department, and at all meetings of the Society, and read the letters received. He shall likewise attend committees, when particularly ordered by the Society, or by one of the Chairmen of such Committees. He shall take down all minutes of the Society's proceedings, and produce them fairly written in the Minute-book of the Society at the ensuing meeting. He shall enter in the Reward-book, under their proper classes, the rewards bestowed by the Society, and make indexes to all the Minute books, and to the Transactions of the Society intended for publication. He

shall paste all letters and papers in the Guard-book. All the written books of the Society shall be kept in the Society's office for the inspection of the members. He shall transcribe all papers or letters that have been prepared by the Secretary or approved by the Society, or by the Committee of Correspondence and Papers. He shall together with the Secretary examine the proofs and revises of the Society's publications—And as a satisfaction for such services, he shall be paid a salary of one hundred and twenty pounds a year.

II. Any member having obtained leave to take copies of the proceedings or papers of the Society, shall pay to the Assistant Secretary, for writing the same, after the rate of two-pence for every hundred words.

SECT. V.

Business of the Housekeeper.

I. THE Housekeeper shall have an apartment in the house of the Society, that she may be ready on the spot to receive messages, letters, and all matters brought to the Society; to answer all enquiries; and deliver plans, lists, &c. to such members as shall come or send for them, of which she shall take care to have a sufficient number. She shall have the custody and care of all the furniture, books, such papers as the Society shall think proper, and other effects whatever, belonging to the Society. She shall have the direction of all the inferior servants. She shall receive and have charge of all the matters sent to the Society by candidates for premiums, and shall enter them properly, at the time when delivered, in a book for that purpose. She shall keep a fair inventory of all the goods and effects of the Society, to be always ready when called for. She shall keep an account of all stationary wares, printed books, coals, candles,

candles, and all other particulars sent in by tradesmen for the use of the Society, in a Day-book for that purpose; and shall enter the same fairly, under their several heads, in another book, to be laid every month before the Committee of Accounts, as a check on tradesmen's bills. For all which services she shall be paid a salary of seventy pounds a year; and fifty pounds to pay the servants, for cleaning the rooms and furniture; and other incidental charges to which she is liable.

SECT. VI.

Business of the Collector.

I. THE Collector shall give such security as the Society shall require, for the trust reposed in him. He shall collect the subscription-money from the members, as it becomes due, paying all he collects over and above one hundred pounds, into the Bank of England, in the names of the two Chairmen of the Committee of Accounts for the time being, which sum of one hundred pounds he may reserve in his hands to defray the current expences of the Society. He shall attend all Committees of Accounts; and at every meeting of the Society he shall lay before them the Bank-Book, with an account of what money he has received, paid into the Bank, or remains in his hands. He shall keep the cash account of the Society, and draw out exact lists of the members, with the sums contributed by each, and arrears due. He shall deliver to the Chairman of the Committee of Accounts, on the last day of January in every year, an account of the members who have paid in the preceding year, as likewise how many were elected, declined, or remained in arrear in that year. For all which services he shall be allowed one shilling in the pound, on all such contributions, but not on legacies and particular donations.

He

He shall attend all meetings and committees of the Society, and inform them of all matters necessary for them to know; for which he shall receive thirty pounds a year.

II. And whereas a Collector, with whose conduct the Society may be well satisfied, may happen to be unavoidably prevented, through sickness or accident, from performing his duty, at a time when it may be prejudicial to the Society to have the collection delayed; or a Collector may have given such cause of dissatisfaction as to render his suspension expedient, and the time requisite for a proper examination into his conduct, before he may be either restored or justly removed, may occasion a prejudicial delay in the collection; the Society to obviate these inconveniences, reserve to themselves the power of suspending in the latter case, a Collector, at any ordinary meeting when twenty members at the least are present; and upon confirmation of such suspension, of appointing, in either of the said cases, a temporary Collector, which appointment shall not require confirmation.

SECT. VII.

Meetings of the Society.

I. THERE shall be five General Meetings every year, in the Great Room of the Society, at seven of the clock in the evening precisely; viz. on the first Wednesday in February, the third Wednesday in April, the second Wednesday in May, the second Wednesday in November, and the second Wednesday in December; At which meetings, or at any extraordinary general meetings only, if fifteen members at least are present, rules and orders for the government of the Society may be made and altered; and such rules, orders, and alterations, being approved at the next succeeding

succeeding general or extraordinary general meeting, shall be valid and binding.

II. An Extraordinary General Meeting may be called, if twenty members, at the least, are present, and the majority shall desire such extraordinary general meeting; which extraordinary general meeting shall be advertised three days successively in two of the daily papers: And if fifteen members are present they may proceed to business.

III. No proposition shall be offered to the Society, as matter of new rule and order, or which shall contain in it an alteration or amendment, of any established rule and order, unless delivered in by a member, ten days before a general meeting of the Society, to the Secretary, who shall immediately cause copies to be made of it, and to be hung up in the Society and Committee Rooms, containing the date of the ensuing General Meeting when the same is to be taken into consideration. At the next general meeting, the Secretary shall, immediately after reading the minutes of the preceding meeting, read all such propositions once over, according to the order they have been delivered in; which propositions shall be read a second time, with a proper pause after each; and if any of those propositions be moved and seconded, it shall then be taken into consideration.

IV. All new rules and orders, once passed, are to be hung up in the Society's room till they are confirmed, with the date when passed the first time, and when to be confirmed.

V. All new rules and orders shall be signed by the President or the Vice-President, and undersigned by the Secretary, and hung up in the Society-room and Committee-room, for the information of the members, till such time

as

as they are inserted in their proper places in the subsequent printed book of rules and orders.

VI. The ordinary Meetings of the Society shall be held on Wednesday in every week, at seven of the clock in the evening precisely, from the fourth Wednesday in October, to the first Wednesday in June; and from the first Wednesday in June to the fourth Wednesday in October there shall be no meeting of the Society, unless called by the President, or two Vice-Presidents, on extraordinary occasions; and proper notice given thereof in the daily papers: And if at such ordinary meetings there should be present eleven or more members, they may proceed on business; but, in case there should not be eleven members present at seven o'olock, they may proceed on business with nine members only. And the said meetings shall have power to appoint such committees as they think necessary.

VII. An extraordinary meeting, for the doing of common business only, may be at any time ordered by the Society, in the same method as an extraordinary general meeting.

SECT. VIII.

Order of the Proceedings of the Society.

I. THE book of Rules and Orders, List of Premiums and of Members, shall lie upon the table before the President, or presiding member, at all meetings; and before the Chairman at all committees.

II. Each member is at liberty, before the President, Vice-President, or presiding member, takes the chair, to deliver to the Secretary, in writing, the names of no more than two persons whom he desires to be admitted auditors at that

that meeting; which names the Secretary shall enter in a list, together with the name of the proposer. The list shall be read as soon as the chair is taken; and, if not objected to, the Collector shall carry the same to the Committee-room, and there call over the several names; when the persons allowed to be present may enter the Great-room, and seat themselves among the members, but shall not be permitted to debate or vote.

III. Persons desirous of being admitted auditors, are to remain in the Committee-room, until their names are called over by the Collector.

IV. No person to be admitted an auditor at any meeting of the Society, unless introduced by a member; nor shall any member propose an auditor to be admitted after the chair is taken.

V. No auditor to be admitted at the meetings of the Society but those who shall have obtained leave of the Society, or members of the Societies of the same kind in Scotland and Ireland.

VI. No member, whose subscription shall be beyond the current year in arrear, shall be at liberty to propose an auditor to be present at any meeting of the Society; and the Collector is directed to attend to this circumstance.

VII. At all meetings, business shall begin at seven o'clock in the evening with reading the minutes of the preceding meeting: but no part of such minutes shall be discussed till the whole has been read through.

VIII. Candidates shall be ballotted for; and, during the ballot, the business of the evening shall be proceeded on.

IX. The

IX. The minutes shall be read a second time; and no other matter shall be proposed till the said minutes have been discussed, article by article: and all parts of the minutes, which are not objected to at the second reading, shall stand confirmed.

X. The President, after the first reading of the minutes, is to declare, that every member is entitled to vote and assist in all the transactions of the Society and its Committees, unless his first subscription shall not have been paid; and that no member shall speak more than once, on one and the same question, unless called upon from the chair to explain himself, excepting only the original proposer of any new motion, who shall be allowed the liberty of replying once on such occasion; and that no person is entitled to be present at any meeting or committee, whose subscription shall be at any time for two full years in arrear; and that no person shall be entitled to debate, or vote at any meeting or committee, until his subscription for the current year, and all arrears, are paid.

XI. Reports from committees shall be made; and the adjournment of those committees, which have not finished the business referred to them, shall be declared to the Society.

XII. All reports from the different committees shall be made to the Society in succession, according to their respective dates, unless when ordered otherwise by the Society.

XIII. A report from a committee, except in the case of a bounty, shall not be recommitted but by a majority of two thirds.

XIV. The report from the Committee of Accompts is to be made between the first and second reading of the minutes, the next Wednesday succeeding the audit.

XV. New

XV. New matter to be considered.

XVI. The president or presiding member, shall then read over to the Society the subjects the committees are to discuss the following days.

XVII. Letters to be read,

XVIII. No question shall be put on any motion, unless the motion be seconded.

XIX. No motion shall be permitted for the repealing any confirmed resolution of the Society, till such resolution has been in force three months; nor shall any motion that has been rejected be made again, till after three months from the time of its rejection.

XX. No new proposition shall be entered upon after ten of the clock at night, unless the motion be read from the chair before ten o'clock.

XXI. No member, on any pretence whatsoever, shall be at liberty to move, that he may have leave to make a motion after ten of the clock.

XXII. No premium shall be offered to the public, unless it has been approved of by a committee, and agreed to by the Society, at one meeting, if the premium shall have been already published in the Society's transactions; or at two meetings of the Society, if it be a new premium: and no premium or bounty shall be given to any candidate, unless the Society, at two meetings, shall be satisfied that such candidate does really deserve the same.

XXIII. When any proposal is made for a premium or reward, and the motion made and seconded, it shall be delivered to the chair in writing, and the same shall be read twice.

XXIV. No motion shall be made for the dispensing with any

any condition of a premium as offered in the advertisement, on any pretence whatever.

XXV. No motion shall be admitted to be made for the lending any of the machines of the Society, on any pretence whatever, excepting for inspection to the Board of Trade, the Solicitor and Attorney General, or some public body, by a special vote of the Society.

XXVI. No proposition shall be carried into execution till it is approved and confirmed by the Society at two subsequent meetings; but, if a negative be put upon an affirmative proposition, or a negative proposition be agreed to, such decisions shall not require confirmation. But this article only applies to ordinary meetings.

XXVII. If, at the second reading of a proposition, any alteration shall be made by way of amendment, such alteration shall not want the confirmation of another meeting, unless the Society shall increase a premium, bounty, or any other expense; in which case it shall require the confirmation of another meeting.

XXVIII. No member shall be permitted to be on the area or space between the tables, while the Society is proceeding on business; nor shall any member stand up within the seats, unless it be to speak, or to go from, or return to his place therein.

XXIX. When any member speaks he shall stand up and address himself to the chair, and the rest shall remain silent.

XXX. When two or more offer to speak together, the President, or presiding member, shall determine who shall speak first.

XXXI. The

XXXI. The member that speaks to order shall be first heard.

XXXII. When a matter is in debate, if any member speaks to new business, the President, or presiding member, shall interrupt him; but the circumstance of the previous question being moved by any member during the debate on any motion, does not necessarily preclude the continuation of such debate.

XXXIII. When on any question an equal number of hands appear to be held up for and against the same, the President, or presiding member, shall appoint two members to count and report the numbers to the chair.

XXXIV. In all meetings and committees, the President, or presiding member, shall only vote when the suffrages are equal.

XXXV. The opinion of the Society shall be taken by ballot, instead of hands held up, if desired by five members.

XXXVI. A division shall not be granted but upon the request of six members.

XXXVII. No new matter, either respecting the government of the Society, or the measures for the improvement of arts, manufactures, and commerce, shall be received, unless it be laid before the Society in writing.

XXXVIII. At every meeting of the Society, all the resolutions of such meeting shall be taken down at large, and read aloud by the Assistant Secretary immediately after they have been respectively agreed to.

XXXIX. No meeting shall be adjourned until the majority of the members present, upon the question being put and seconded, shall agree thereto; nor shall the question be put until the names of the candidates proposed at such meeting have been read.

SECT. IX.

Order of Proceedings at a General or an Extraordinary General Meeting.

I. THE minutes of the preceding ordinary meeting shall be read.

II. The President, or presiding member, shall then declare the meeting to be a general or an extraordinary general meeting.

III. The minutes of the preceding general meeting shall be read the first time; and after a short pause shall be read a second time; when such parts as are not objected to shall stand confirmed.

IV. New matter relative to such meetings only may be proposed and discussed.

V. If, after a proper pause, no new matter is proposed, then the general or extraordinary general meeting shall be adjourned to the next general meeting in order; after which the usual business is to go on.

VI. Every proposition that is to be discussed at a general meeting, shall be publicly read by the Secretary, on the preceding Wednesday, immediately after the second reading of the minutes, and usual declaration from the chair.

SECT. X.

Election of Members.

I. No person is to be proposed for a member, unless recommended by three members; and the name, place of abode, and addition of the person recommended, shall be delivered

delivered in, signed by the proposers, which shall be read by the Secretary, who shall insert the name in a list of candidates, to be hung up in the Society and anti rooms, until the second following ordinary meeting of the Society, at which such persons shall be balloted for, provided there be fourteen days between the meetings: The names of the proposers, together with the name and addition of the person to be balloted for, shall be put upon the ticket, placed on the box, during the time of such ballot. The Collector, having a sufficient number of balls, shall give one to each, of the present balloting members, and, if two thirds of the members then voting shall ballot in his favour, he shall be deemed a perpetual member, upon payment of twenty guineas at one payment; or a subscribing member, upon payment of any sum, not less than two guineas annually (BB). Peers of the realm, and Lords of Parliament, desirous of becoming members of this Society, shall on their being proposed at any meeting of the Society, be immediately balloted for. Ladies are eligible as members of this Society; are entitled to attend and vote in its proceedings and committees, and are alone entitled to vote by proxy on elections only, through the medium of some gentleman who is a member, but such member must produce a written authority from the lady for whom he votes as proxy.

II. In election of members, a second ballot shall be granted, if immediately demanded.

III. Every person, upon his election, is to pay his subscription-money, or one of the members is at liberty to make the deposit, in his name, in case of absence.

IV. Every member shall pay his subscription-money in arrear within one month after he has been applied to by letter from the Collector for that purpose, according to the

copy annexed, (C); and no person shall be entitled to debate or vote, at any meeting or committee, until his subscription for the current year, and all arrears, are paid: And no person shall be entitled to be present at any meeting, or committee, whose subscription shall be at any time for two full years in arrear: Yet as several, who have declined continuing their subscriptions for a time, may be again desirous of becoming members, but by the foregoing rule and order seem to be precluded until their arrears shall be discharged, it is hereby ordered, that any such person shall be capable of being re-elected a member of the Society, in the same manner, and on the same terms, as if he had never been a member before.

V. When any person is elected a member, the Secretary shall immediately inform him thereof by a letter (D); and the Collector shall wait upon him, if in town, and carry a printed book of rules and orders, and the list of premiums.

VI. The names of such persons as have not paid their first subscription-money, are to be omitted in the list of members.

VII. Foreigners, or persons who do not reside in Great Britain, may be elected, by ballot, corresponding members of this Society, without being subject to any annual payment: and shall be admitted to the meetings and committees of the Society during their residence here, provided such residence does not exceed three months at one time; but shall not be permitted to vote.

VIII. On election of any person to be a corresponding member of this Society, a letter shall be written by the Secretary, acquainting him therewith; and the Secretary, in such letter, shall enclose him an exact copy of the standing rule and order, "That no member of this Society shall

"hereafter

" hereafter be a candidate for, or entitled to receive any pre-
" mium, bounty, or reward, except the honorary medals of
" the Society ;" and also, that the Society request their corresponding members, as often as shall be convenient, to favour them with accounts of such useful discoveries or improvements in any of the polite or economical arts, as may come to their knowledge.

SECT. XI.

Of Committees.

I. THE standing committees for the year shall be declared, and the members thereof shall be named by the Society, at eight o'clock, on the first Wednesday in March; and a general committee of election, to which the chairmen and members of the several committees shall be especially summoned, shall meet on the Friday next ensuing, to take into their consideration the choice of two chairmen to each of the several committees for the following year, and report their names to the Society on the second Wednesday in March, as proper persons to serve as chairmen in the respective committees, under the titles of which they shall be severally inserted, as follows:

Committee of Accounts.
Correspondence and Papers.
Agriculture.
Chemistry, Dyeing, and Mineralogy.
Polite and Liberal Arts.
Manufactures.
Mechanics.
British Colonies and Trade.
Miscellaneous Matters.

And they are to report and recommend them to the Society as proper persons to be elected at their annual election of officers, to be held on the twenty-second day of the same month.

II. Nine committee minute books are to be kept; one for each of the above-mentioned committees.

III. Two chairmen shall be elected by ballot, for the Committee of Accounts, Committee for Miscellaneous Matters, Committee of Correspondence and Papers, and each class of the Committee of Premiums severally; who shall preside for that year when present, in the order they are named; and in case neither of the said chairmen should be present at their respective committees, any other member shall be appointed by the committee, chairman for the occasion.

IV. Committees shall not take up any matter, unless referred to them by the Society; and no decision on the merits of any question referred to the committee shall be made after eleven o'clock.

V. All committees shall be summoned, and the matters referred to them shall be specified in the respective summonses; and when any matter is referred to any of the committees of this Society, the mover thereof shall be summoned to attend such committee when the same is taken into consideration.

VI. All committees shall have power to adjourn themselves as they think fit; and, notwithstanding particular gentlemen are named for each committee, every member is of every committee.

VII. If a member shall signify to the Secretary his intention to attend any committee, he shall be summoned to it; and

and the Secretary shall be directed to summon such other members and other persons as the chairman apprehends to be most conversant in the business to come before them; which business also shall be declared in the summons: And three members shall constitute a committee.

VIII. In order that every member may be the better informed of the times of the meetings of the several committees, in general cases they are fixed in the following manner:

Committees of Correspondence and Agriculture, on Monday.
Colonies and Trade, and Manufactures, on Tuesday.
Mechanics, on Thursday.
Polite Arts, on Friday.
Chemistry, on Saturday.
Accounts, in the first week in every month.

IX. It is the duty of a chairman to observe that no question be put to the committee, unless three members are present; and, before an adjournment of such committee, or report concluded, that the minutes be read, and signed by the chairman, who shall certify that three members at least were present. And the chairman is requested to attend the reports of the committee in which he presided, when such reports are made to the Society.

X. The chairman shall take care that regular meetings of the committee be appointed, and that their reports be made, fairly written, and without blanks, so soon as any one or more of the subjects referred for their consideration have been disposed of; or when they may deem it requisite to gain further directions from the Society; but in case upon appointment of a committee, a sufficient number do not attend, the chairman is required to appoint another day, and shall direct the Secretary to summon the Committee

on a future day, at a distance of not less than three days inclusive.

XI. There shall be constantly hung up in the Society's room and committee-room, a list of all committees, specifying the business they are to consider, and the days they are appointed to meet.

XII. No pecuniary or other reward shall be given to any candidate for a premium or bounty, for his trouble or attendance on any committee, to whom such matter shall be referred by the Society for their consideration, unless by order of the Society.

XIII. All references to the several committees shall be entered in the respective committee-books, in one list, at the beginning of such books, in order that the subjects of them may be regularly taken up.

XIV. Lists of reports that are ready to be made, or standing for confirmation, with their dates, shall always be hung up in the great room.

XV. Every committee shall direct the Secretary to write to one or more of the persons subscribing any certificate in claim of a premium in Great Britain, or to such other person as the committee may think proper, for a further information of the truth of such certificate, and shall wait for an answer as to the reality of their having signed the same, before the adjudication of such premium.

SECT. XII.

Of Rewards.

I. The chief object of the attention and encouragement of the Society, in the application of their rewards, are ingenuity

ingenuity in the several branches of the polite and liberal arts; useful inventions, discoveries or improvements in agriculture, manufactures, mechanics, and chemistry; or the laying open any such to the public; and in general all such useful inventions, discoveries, or improvements, as may appear to have a tendency to the advantage of trade and commerce.

II. The Society reserve to themselves the power of giving in all cases, such part only of any premium as the performance shall be judged to deserve, or reserving the whole if there be no merit.

III. The premiums of the Society shall extend to Great Britain and Ireland, and all the British Isles.

IV. No member of this Society shall be a candidate for, or entitled to receive any premium, bounty, or reward whatsoever; except only the honorary medal of the Society. And no member having delivered in his claim for any premium offered by the Society, and afterwards withdrawn the same, shall be entitled to take a part in the deliberations, or vote on the claims of other candidates who may have claimed such premium.

V. No member who is a candidate for the honorary premium or medal of this Society, shall be of the committee to which such matter may be referred; or ever present at their sittings, while the subject is under consideration, unless called in to answer such questions as the committee may propose; nor shall any such candidate be present in the Society when the matter is before them, whether in debate, or for determination, unless called in. Which rules, all members being such candidates, are strictly to observe, under penalty of forfeiting their title to such medal, notwithstanding any determination of the Society in their favour.

VI. If

VI. If any member shall be afterwards found to have transgressed the rules mentioned in the preceding resolutions, by the means of a borrowed or fictitious name, such member shall be expelled the Society.

VII. No member who is the father, son, or master of a candidate for a premium, bounty, or reward, nor any person any-wise lucratively interested in such an event, shall be of the committee to which such matter is referred; nor present in the Society when it is under consideration, unless called in, under penalty of excluding such child, father, scholar, apprentice, or servant, from all title to any such premium, bounty, or reward, notwithstanding a determination of the Society in their favour.

VIII. A candidate for a premium, or person applying for a bounty, being detected in any disingenuous methods to impose on the Society, shall forfeit any such premium or bounty, and be deemed incapable of obtaining any for the future.

IX. No candidate who is not a member, shall be present at any of the meetings of the Society or committees, or admitted at the Society's rooms, after they have delivered in their claims, till such claims are adjudged, unless summoned by the committee, under forfeiture of the premium or bounty for which they are candidates.

X. No machine, or model of a machine, shall be admitted to claim a premium, unless the whole and every part thereof, shall be delivered into the Society's office at or before the time appointed by the Society. And if any candidate shall secretly make addition to, or alteration in his machine or model, otherwise than by repairing and putting the several parts together, after it is lodged with the Society, he shall on discovery be deemed incapable of receiving any premium.

XI. The

XI. The Society shall, whenever they think proper, desire the assistance of such gentlemen, manufacturers, or others, though not members of it, as shall be deemed best able to judge of, and discover the truth and value of any matter or thing for which a premium has been claimed.

XII. No medal, or sum of money, shall be given as a bounty or reward for any thing not mentioned in the list of premiums at any time, unless fifteen members are present; and the majority to bestow such medal or sum of money, shall consist of two-thirds at least of the members then present; the same to be confirmed by ballot.

XIII. If a claim for a premium shall be rejected by the Society, no motion shall be made for giving to the candidate, in lieu of such premium, any bounty of equal honour or value with the premium offered.

XIV. Every person who shall receive any premium or bounty from the Society, shall relinquish all pretensions to a patent for any matter for which he has obtained such premium or bounty. No model or machine, for which a patent has been obtained, or is proposed to be obtained, shall be admitted into the repository of the Society.

XV. No member who has obtained a patent for any article similar to such as may be produced to the Society, shall be allowed to vote either in the committee or Society on that subject.

XVI. If any reward be conditionally voted by the Society, and the imposed conditions be not completed within one year from the time of such vote, the reward is to be considered as void, unless further time shall be granted by the Society for complying with the said conditions, in consequence of an application in writing made by or from the said claimant.

XVII. The

XVII. The several candidates and claimants to whom the Society shall adjudge premiums or bounties, are to attend at the Society's house in the Adelphi, on the last Tuesday in May of that session, at eleven in the morning precisely, to receive the same; that day being appointed by the Society for the Distribution of their Rewards; and before that time no premium or bounty will be delivered, except to those who are about to leave the kingdom.

In cases where the Society may think fit to admit excuses for not attending in person, deputies may be substituted to receive the rewards, provided such deputies are either members of the Society, or superior officers thereof.

At the annual distribution of the Society's Rewards, no member shall be at liberty to give tickets for the admission of more than two ladies and one gentleman, as auditors at the distribution of premiums.

The tickets to be issued from the Secretary's office, and signed by the member who gives them; and not more than one individual to be permitted to attend as a visitor on that day for each order or ticket of admission.

SECT. XIII.

Resolutions.

I. THAT all models of machines, for which persons obtain premiums or bounties, shall become the property of the Society, and correct written descriptions be furnished with them; and where machines are rewarded, that complete models, or correct drawings, and proper written explanations, be delivered to the Society by the persons entitled to such rewards.

II. All

II. All the written accounts, for which any premium is offered and given, or for which the Society have given a bounty, shall be published; such accounts being first referred to a committee to prepare them for publication.

III. With the list of premiums, an account of all the medals, premiums, and bounties, which have been given by the Society the preceding year, to whom and for what purposes, shall be printed annually.

IV. In the list of the members, after the name of each member, his addition and place of abode are to be inserted.

V. The committee of correspondence are at liberty from time to time, to refer such letters as they esteem proper to the respective committees, without reporting them to the Society, in order to be referred to such committee; except such as propose the granting any new premium or bounty.

VI. All the books of the proceedings, correspondence, &c. of the Society, shall be kept in the Society's office to be inspected by members at any reasonable hour; the housekeeper having for that end a key to the presses.

VII. Members wishing to obtain copies of papers belonging to the Society, shall give a list of such papers as they want, which lists shall be read by the Secretary.

VIII. That no book be purchased for the library of the Society, until it has been recommended by the committee most competent to judge of its merits and usefulness.

IX. No member is to be permitted to borrow from the library more than either one folio, one quarto, or two octavo or 12mo. volumes at one time; but that this liberty shall not be construed to extend to manuscripts, the Transactions of literary and other politic bodies, lexicons, or dictionaries, which shall on no account be lent out of the library.

No

No member is to be permitted to keep any book longer than fourteen days.

A book is to be provided by the housekeeper in which the titles of the books borrowed, with the names of the person borrowing the same, shall be inserted by the member who borrows such books, and when they are returned, countersigned by the housekeeper.

That such book of the housekeeper be laid before the chairman of the Miscellaneous Committee at every meeting thereof, in order that it may be seen that the above regulations be properly attended to.

X. No person shall be permitted to make any sketches, finished drawings, or paintings, from any statues, busts, casts, drawings, prints or pictures in the Society's possession, without leave first obtained from the Society.

XI. That the Society do not, under the notion of varnishing, touching, or on any account whatever, suffer any painter to meddle with the series of pictures in the Great-room.

XII. That for the better regulation of the dealings of the Society with tradesmen and others, all persons having any claims on the Society, be in future directed to send in an account of their demands once in every three months from the time of their accruing; and the committee of accounts shall at their next monthly meeting inspect such demands, and report upon them to the Society, when the bills recommended for payment, upon such recommendation being confirmed by the Society, shall be discharged at the ensuing monthly meeting of that committee, by the joint drafts of the chairmen on the Bank of England, or by part of the money remaining in the Collector's hands, as the said committee or either of its chairmen shall direct.

N. B.

N. B. To persons inclinable to leave a sum of money to this Society by will, the following form is offered for that purpose:

ITEM, I give and bequeath unto A B and C D, the sum of upon condition, and to the intent, that they or one of them, do pay the same to the collector, for the time being, of a Society in London, who now call themselves *The Society for the Encouragement of Arts, Manufactures, and Commerce;* which said sum of I will and desire may be paid out of my personal estate, and applied towards carrying on the laudable designs of the said Society.

(A)

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Committee of Accounts.	Committee of Accounts.
Correspondence and Papers.	Correspondence and Papers.
Polite Arts.	Polite Arts.
Agriculture.	Agriculture.
Manufactures.	Manufactures.
Mechanics.	Mechanics.
Chemistry.	Chemistry.
Colonies and Trade.	Colonies and Trade.
Miscellaneous Matters.	Miscellaneous Matters.

(BB)

No. 18

RECEIVED of
the sum of being his
contribution to the *Society for the Encouragement of Arts, Manufactures, and Commerce*, for one year from

£. VICE-PRESIDENT.

No. 18

RECEIVED of
the sum of being his
life contribution to the *Society for the Encouragement of Arts, Manufactures, and Commerce.*

£. VICE-PRESIDENT.

SIR, (C)

I AM directed to inform you, that your annual subscription of has been in arrear since the day of and as it is of consequence for the Society to know what sums of money they can bestow in premiums, you are requested to order the payment of it.

By order of the Society,

COLLECTOR.

(D)

SIR,

I HAVE the honour to acquaint you, that on this day you were elected a Member of the *Society for the Encouragement of Arts, Manufactures, and Commerce*; and as, by their Rules and Orders, every person on his election is to pay his subscription-money, and is not confirmed a member till such subscription be paid, you are requested to order the said payment to be made to the Collector.

I am, Sir, your very humble Servant,

ADELPHI, SECRETARY.
February, 1812.

Printed by Order,
CHARLES TAYLOR, M. D. SECRETARY.

PRESENTS.

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CXVI. A Model of a Temporary Corn Rick, by William Jones, Esq. See page 46.

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XII. A Plan of the City of Mexico, by the Viceroy of Mexico. See page 207,

XIV. A Box containing 32 Mexican Medals, by the Viceroy of Mexico. See page 207.

A

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OF

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TO THE

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FOR THE

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N. B. Those marked with ** pay Five Guineas annually; those marked with * Three Guineas annually; those with P are Perpetual Members; those with †† have served the office of Steward; and those marked with † are Stewards Elect.

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R. Wilks, Printer, 89, *Chancery-lane.*

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